# CONTROLLING SHAREHOLDING, OUTSIDE DIRECTORSHIP AND EARNINGS QUALITY: PRE- AND POST- IFRS ADOPTION CONSIDERATION AMONG GHANA'S LISTED FIRMS

**By**

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# DECLARATION

I hereby declare that this submission is my own work towards the MPHIL Accounting Degree and that, to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text'.

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**ABSTRACT**

This study examines the influence of controlling shareholders and outside directors on earnings quality (EQ) among listed firms in Ghana and compares such influence before and after the adoption of International Financial Reporting Standards (IFRS) in 2007. To empirically measure EQ, the study uses earnings management (EM). Lower EM suggests higher EQ and vice versa. Using 21 listed firms covering a period from 2004 to 2013, the results of both panel-based and pooled regressions indicate that overall, IFRS adoption is significantly and negatively associated with a subsequent reduction in EM. The declined EM suggests that EQ improves for the post-IFRS period relative to the pre-IFRS period. The study also finds that firms with controlling shareholders are significantly associated with lower EM (higher EQ). This is especially true when the controlling owner is locally private investor rather than the state or foreign parents. The study however obtains evidence which suggests that having more outside directors and CEO/chairman separation result in more EM (less EQ). The study therefore shows that owner control is more effective in monitoring management than board control. The study uses interactive terms to find out whether the influence of controlling shareholders and outside directors on EQ is affected by or affects the impact of IFRS adoption and generally finds a very weak evidence that such influence changes post-IFRS in relation to EQ. However, when the outside director proportion is at least 88%, the board becomes less ineffective after the accounting standards change. With the foregoing, the study makes significant contributions to debates on whether large owners monitor or expropriate, whether board monitors effectively in the presence of large owners. Even though the study is limited to Ghana, it provides early evidence on which firms are more likely to manipulate earnings and whether IFRS matter in an emerging economy. For policy implications, findings at least, suggest that while controlling owners and IFRS do constrict agency costs of EM boards do not. This should inform regulators that the full application of Western corporate practices may be of less monitoring value to at least listed firms in Ghana.

# DEDICATION

*To my beloved and supportive late MUM whose death occurred during the final*

*year of my studies*

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# CHAPTER ONE

# INTRODUCTION

## 1.0 Background of the study

In 2007, Ghana announced a decision to adopt the International Financial Reporting Standards (IFRS) in its quest to improve upon accounting information produced by firms in the country. This action was even more needed in the wake of the country's desire to attract more foreign investments. By and large, the move to adopt the IFRS marks a dramatic change in the country's accounting regulations (Assenso-Okofo, Ali and Ahmed 2011). So far, much reservation exists about whether IFRS, accounting standards developed by advanced countries, produce any real benefits to emerging economies like Ghana (Mir and Rahaman, 2005) where enforcement structures are weak and demand for high quality reporting is naturally low (Leuz, Nanda and Wysocki, 2003). For instance, Liu and Hu (2011) argue that it is apparently important for researchers to look into whether IFRS adoption increases accounting quality in different contexts since IFRS do not remove differences in political, institutional and economic settings.

Generally, many accounting scholars and practitioners consider IFRS as a higher quality set of accounting standards than many domestic standards (e.g. Barth, Landsman and Lang, 2008; Daske, Hail, Leuz and Verdi, 2008; Cai, Rahman and Courtenary, 2014). According to Barth et al. (2008), IFRS are regarded as higher quality standards because: a) IFRS constrain managerial discretion by removing certain alternative treatments; b) IFRS are regarded as principles-based accounting standards and hence are probably more difficult to circumvent; and c) the use of fair value under IFRS allows for better reflection of underlying economics of firms.

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Hence, IFRS are expected to lead to higher transparency, quality financial reporting and improvement in general information environment. However, a strong belief exists about whether the application of IFRS always results in the professed informationrelated benefits as management may exercise the discretion afforded them by IFRS in an opportunistic manner. Thus, firm-level and managerial incentives play a crucial role if IFRS are to result in their intended benefits such as enhanced earnings quality. To this end, this study seeks to examine the association of controlling shareholding and outside directorship with the level of earnings quality, a reporting outcome, and whether the associations of the two governance mechanisms change after the adoption of IFRS or whether they influence how IFRS adoption affects earnings quality in Ghana.

Previous studies provide strong evidence that listed firms in Ghana are characterized by dominant and controlling share ownership (Agyemang and Castellini, 2015). In the presence of highly concentrated ownership, it is expected the traditional ownermanager agency conflict reduces because even though this conflict starts from the point where there is divergence between ownership and control it becomes more serious when ownership is diffuse (Berle and Means, 1932, as cited in Ding, Zhang and Zhang, 2007). This is in line with the argument of Shleifer and Vishny (1997) that few large shareholders can better oversee the activities (including financial reporting) of management because these shareholders have higher motivation and ability to do so. This, consequently, should result in more transparent reporting through unbiased exercise of reporting discretion. On the flip side, controlling shareholders usually may become so entrenched that they tend to extract private benefits from the firm to the detriment of minority shareholders leading to a second form of agency conflict between controlling and non-controlling owners (Fan and Wong, 2002). In this case, they will connive with directors and management to opportunistically exercise the accounting

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discretion to permit manipulation of reported figures in an attempt to avoid leaking out malodorous inside deals to small shareholders (Ding et al., 2007). This becomes so possible especially when directors are mostly appointed by them.

Both Mensah (2002) and Agyemang and Castellini (2015) disclose that only a few or single controlling shareholders appoint almost all board members of listed firms in Ghana with minority shareholders having no or little stroke of influence over how corporate boards are composed. As part of corporate governance principles, company boards are basically responsible for fulfilling two roles: monitoring and advisory (Armstrong, Guay and Weber, 2010). Armstrong et al., (2010) indicate that for a company board to be effective in fulfilling the first role which is the focus of this study, the board should be independent, skillful and knowledgeable. Effective monitoring by the board over financial reporting activities ensures that the reports give the true picture of the company's underlying performance. Reported earnings in this case can be considered as quality and useful measure of performance if they are likely to be least managed, less smoothed, more sustainable, and more value relevant (Barth et al., 2008). Arguably, earnings management dents on quality the most as firms that often map through crises are usually associated with low quality earnings due to managed earnings (e.g. Dechow, Sloan and Sweeney, 1996). Extant literature provides extensive evidence that outside directors and outside board chairs do play key roles in enabling corporate boards to monitor management effectively in order to enhance the quality of reported figures (García-Meca and Sanchez-Ballesta, 2009) among which earnings are usually considered the most important (Degeorge, Patel and Zeckhauser, 1999). However, the monitoring value becomes indecisive when the appointment of all these outside directors including the chairperson falls under the large shareholders' control. Some Ghanaian studies have found outsiders on company board to have no or little monitoring

value to ―disadvantaged‖ shareholders. For instance, a study by Ogeh Fiador (2013) finds no significant association between board composition and value relevance of earnings and reports significantly negative association for CEO/chairperson separation. Bokpin (2013) also reports similar findings in relation to association of outside directors with disclosure level.

Literature proves that the relationship between corporate governance mechanisms and the quality of reported earnings can be affected by the quality of information available to monitors. Notably, since effective monitoring requires quality information (Armstrong et al., 2010) should IFRS adoption improve information quality as expected then the monitoring value (entrenchment cost) of controlling owners should be enhanced (reduced) and the effectiveness (ineffectiveness) of outside directors as monitors should improve (reduce). Equally, controlling ownership and outside directorship may also enhance or reduce the chances of IFRS in causing improvement in earnings quality. These issues are explored in the study from Ghana‘s context.

## 1.1 Problem statement

Strong evidence exists that Ghana, just like many other developing economies, is characterized by high level of concentrated shareholding (Agyemang and Castellini, 2015). The presence of large shareholders creates a debate of whether large shareholding leads to better monitoring or results in large shareholder expropriation of firm‘s wealth (Brown, Beekes and Verhoeven, 2011). Either of the two sides has financial reporting implications (Fan and Wong, 2002). Several studies have gone on to investigate the relationship between concentrated ownership and earnings quality especially in Asia (e.g. Liu and Lu, 2007), Continental Europe (e.g. Sánchez-Ballesta and García-Meca, 2007) and Latin America (e.g. Gonzalez and Garcia-Meca, 2014)

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but few of such have happened in Sub-Saharan Africa including Ghana (e.g. Ogeh Fiador, 2013). More to that, so far the results have been inconclusive as to whether large shareholding improves or reduces earnings quality leaving a gap to fill.

Agyemang and Castellini (2015) report that in the presence of a controlling shareholder in a listed firm in Ghana the decision on who becomes a board member or board chairperson is almost the prerogative of that large shareholder. In such a situation, the real independence required of outside directors to cause company board to function effectively in discharging its responsibility of providing financial reporting oversight may be some distance away from reach. A study is yet to be carried out to investigate whether outside directors are effective to allow the board to constrain opportunistic reporting which reduces earnings quality under the extant background.

Further, it is noted in literature that the quality of applicable accounting standards matters if reporting quality is to be achieved (see Cai et al., 2014). However, to the best of my knowledge of existing literature, following the adoption of IFRS in Ghana in 2007, no discernible study has been carried out to find out whether and how the ―more quality‖ IFRS have resulted in enhanced earnings quality among complying firms. Finally, many authors argue that certain firm-specific governance features cause some firms to benefit more or lose more after IFRS adoption (e.g. Daske, Hail, Leuz and Verdi, 2013) but studies into this issue are still developing (Marra, Mazzola and Prencipe, 2011) and hence, there is an avenue for more studies to take place.

It is on the basis of these issues that this study examines the associations of controlling shareholding and outside directorship with the quality of accounting earnings and whether and how the associations of controlling shareholding and outside directorship

change for the post-IFRS period. The objectives developed to pursue the research aim are outlined next.

## 1.2 Research objectives

The main objective of the study is to find out whether and how earnings quality is associated with controlling shareholding and outside directorship among Ghana's listed firms and whether and how the impacts of the move to IFRS on earnings quality are influenced by or have influenced such associations.

The following specific objectives are pursued: To find out;

1. whether the switch to IFRS has improved the quality of reported earnings among the sampled listed firms covering a period from 2004 to 2013;

2. whether controlling shareholding is associated with the quality of reported earnings among the sampled listed firms covering a period from 2004 to 2013;

3. whether outside directorship is associated with the quality of reported earnings among the sampled listed firms covering a period from 2004 to 2013; and

4. whether the association (if any) of controlling shareholding and outside directorship with the quality of reported earnings differs between pre- and postadoption of IFRS among the sampled listed firms covering a period from 2004 to 2013.

## 1.3 Contribution of the study

The key contributions of this study span the following:

1. Investors, securities analysts, board of directors and other users of financial information will find the findings beneficial by being able to better understand the role that key corporate governance schemes play in the provision of accounting information by firms. The results should enable investors and other users to

appreciate how differences in governance result in different levels of quality of accounting information. This, thus, may enable decision-makers to arrive at possibly better choices.

2. Industry players

The results of this study will enlighten corporate bodies to understand which corporate governance measures work best for firms in terms of aiding to constrain earnings management practices and improve quality. These corporate bodies in their quest to satisfy shareholders and attract potential investors tend to follow good corporate governance practices; once shareholders are able to gain reliable information regarding the performance of firms, their response to financial performance measures becomes greater.

3. Regulators of Ghana Stock Exchange (GSE)

The empirical results of this study will inform regulators on whether new governance variables should be introduced or existing ones revised or repealed. It is expected that such actions taken on the basis of empirical findings should lead to a better and overall improvement in earnings quality. Empirical evidence that supports the importance of corporate governance's role would:

a. justify that the costs of imposing governance requirements on firms are outweighed by the benefits; and

b. provide regulators with adequate validation to impose more corporate governance rules

4. IFRS non-compliant emerging countries

As a lot more of emerging countries, especially Sub-Saharan African countries, are yet to make a switch from their domestic accounting standards to IFRS, the findings of this study may provide evidence of whether the switch benefits an emerging

country at the firm-level in particular so as to inform their decision to adopt or not. However, the study offers only firm-level impacts and so countries yet to adopt should then be cautioned that the overall country level benefits such as political and macro-economic benefits may also have to be considered. Already global giants like the United Kingdom (UK), United States (US), Australian, China, Japan, Canada, the European Union, etc. all support the IFRS idea and hence adoption of these international standards should result in enhanced acceptance. More so, there are likely to be enhanced foreign direct investments, improved network benefits, among others.

5. For researchers the results from the study contribute to the extant literature in the following ways:

   a. From the literature review conducted, this study seems to be one of the earliest, if not the first, of its kind to associate controlling shareholders and outside directors with the quality of earnings under the setting of IFRS adoption. The findings contribute to the arguments over the substitutability or complementarity between incentives and accounting standards in improving reporting quality from an emerging African economy which has made a ―wholesale‖ adoption of IFRS. Further, the study reveals the relationship between controlling shareholders (insiders) and outside directors (outsiders) in monitoring the firm's financial reporting process.

   b. The study helps to extend the application of abnormal working capital accruals, a method considered to be a more appropriate approach (Marra et al. 2011) to detect earnings management in finite sample studies. The model has not been used a lot in earnings management studies (see García-Méca and Sánchez-Ballesta, 2009) even though the model was proposed in the work of DeFond

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and Park (2001) more than a decade ago. Thus, this study contributes to gaining external validity for abnormal working capital accruals measure of earnings management.

c. The findings of this study provide the foundation for further research works. The findings may serve as basis for related studies such as the implication of earnings management for capital market operation in Ghana, implication on fees charged by auditors, motives behind earnings management, among a lot more. The study can also be extended to cover similar countries to permit a broader generalization of the study findings.

However, readers should pay attention to the constraints under which the study is carried out. The next section presents the scope and limitations of this study.

## 1.4 Scope and limitation of the study

The study focuses only on non-financial Ghanaian listed firms using 10 years unbalanced data from 2004 to 2013. The restricted sample size naturally constrains the external validity of the study findings while the unbalanced nature of the dataset may introduce noise into the associations established. On the flip side, it is observed that the use of small sample size for IFRS consequences studies is more likely to produce less noisy results (Brũggemann, Hitz and Selhorn, 2013) while the unbalanced dataset reduces or overcomes the survivorship and selection bias (Chen and Zhang, 2014).

The study also limits the measurement of earnings quality to only one broad earnings quality measure, abnormal accruals even though many other quality dimensions exist in literature. Nonetheless the study attempts to justify the reason for the choice at Section 2.2 of next chapter. It has still been inconclusive and uncertain as to which

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variables and/or models for capturing earnings management is the best as there is no measure or model without inherent limitations. This study suffers from the same problem of using just one main measure to detecting earnings management but the sensitivity analyses done in this study employing an alternative earnings management measure help to improve the robustness of the study results. Further, the variables used for study have been differently measured in previous studies. Hence, the measurements adopted may not fully reflect the true sense of variables. To some extent however, this study attempts to eliminate or reduce the possible measurement biases by using those measures and definitions that are used much in extant literature. Last, the use of extended period for such study as this may cause noisy results as many other factors occurring during the period could account for the resultant associations. To minimize this however, a good number of additional regressions have been run to ensure that the possibly least noisy results are obtained. The next section presents a summary of the study methodology.

## 1.5 Methodology

The study collects all data required to measure the variables from the specific annual reports of the sampled companies. The GSE Fact Books of 2006 and 2010 serve as additional sources of data. The final data are in unbalanced form and relate to a tenyear period from 2004 to 2013. The annual reports from which the data are drawn are obtained from the GSE Library and Annual Reports Ghana.

In line with Marra et al. (2011) and other studies, this study specifies models each of which includes dependent, independent and control variables. The dependent variable of the study is earnings management measure operationalized as the absolute value of abnormal working capital accruals. The independent variables include ownership

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structure (presence of controlling shareholder), outside director (proportion of outside directors represented on the board and separation between CEO and board chairperson's roles) and IFRS adoption. The control variables include the holdings of top one shareholders, board size, growth, leverage, firm size, performance and audit quality.

Data are analyzed using multivariate analysis based on random effects and ordinary least square regressions. Further to these, fixed effects estimations are also run as way of robustness check. Before conducting the multivariate analysis, the study first conducts various descriptive, univariate and correlation analyses. Necessary data and regression diagnoses are also performed to ensure appropriate model specifications and estimations.

## 1.6 Organization of the study

The rest of the thesis is organized as follows:

Chapter 2 is devoted to the review of prior relevant literature. In the main, the author defines key terms used in the study, discusses the institutional framework, explains relevant theories, presents the review of previous scholarly works, develops the conceptual framework and finally summarizes key findings and methodologies of related past studies to draw distinction between this present study and the past ones.

Chapter 3 provides the research data and methodology. Specifically, in this chapter, the author discusses the philosophical approach, the research design, measurement of all the various variables, model specifications, data collection, sample selection procedure and techniques for analyzing the data.

Chapter 4 presents the results of data analysis and findings discussion. The chapter first reports the descriptive statistics, univariate analysis and correlation analysis. Next, it provides the outcome of key data and regression diagnostics prior. Just after that, the results of the multivariate analysis and further analysis are reported. The chapter ends by discussing the findings obtained.

Chapter 5 presents summary of findings, overall conclusion of the thesis and recommendations of this study. Key specific items in the chapter include highlighting the key findings (and their link to theory and policy implications), making recommendations that have policy implications, outlining the limitations of the study and giving recommendations for further studies. The conclusion restates the study's contribution to knowledge.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.0 Introduction

This chapter focuses on building upon the study background discussed in chapter one by discussing the main concepts being studied, the relevant institutional framework that sets up the forerunner to this study, the theoretical foundations and the previous empirical evidence related to the issues under study. The conceptual framework is then developed. In the course of the discussion throughout the chapter, explanation and justification of the research focus adopted for this study in the context of past works and the research setting are precisely offered. The review leads to the main research gaps which the study attempts to fill.

Section 2.1 discusses the concept of earnings quality. It then pays special attention to earnings management (and abnormal accruals) which measures earnings quality in this study. Section 2.2 next presents the institutional framework which encompasses capital development in Ghana, Ghanaian financial reporting regulation, and shareholder structure and board composition of the firms listed on the GSE. Next, Section 2.3 deals with the theoretical foundation of the study. Section 2.4 follows with the review of prior empirical works and statement of the study hypotheses. Section 2.5 shows the conceptual framework. Section 2.6 summarizes previous related works and notes how this study is distinct from the previous works.

## 2.1 Earnings Quality

### 2.1.1 Definition and explanation

The quality of externally reported accounting earnings is deemed to be one of the most important characteristics of financial reporting systems (Ewert and Wagenhofer, 2011). Ewert and Wagenhofer (2011) note that earnings quality is a widely used measure in empirical accounting research for among other things evaluating changes in accounting standards and in other institutions including corporate governance, ownership structure and enforcement. Alas and surprisingly, the concept of earnings quality remains elusive to date.

Many authors have described the concept differently from different perspectives at different times in different contexts perhaps because what suggests quality of earnings is contingent on the kind of decision that the user takes on the basis of the earnings information (Dechow and Schrand, 2004). For instance, Schipper and Vincent (2003) construe earnings quality from the theory of economic income to mean the ability of earnings to reflect the change in real wealth between two periods. By Dechow and Schrand (2004) earnings quality should be looked at from three angles: a) the extent to which earnings are a reflection of the real current operating performance; b) the degree to which earnings are suggestive of future operating performance; and c) the level at which earnings that accurately annuitize the intrinsic value of the company. To a larger extent, the concept of earnings quality connotes the extent to which earnings objectively and validly reflect the true sense of the current operating performance and economic value of the firm (Dechow, Ge and Schrand, 2010; Cai et al., 2014). Different measures are used in empirical studies to indicate earnings quality and these are outlined next.

## 2.1.2 Measures/indicators of earnings quality

As earlier on mentioned, scholars have over the years attempted to measure as accurately as possible the elusive concept of earnings quality. Different measures consequently have been used to measure earnings quality in empirical studies. Dechow et al. (2010) classify all these measures into three broad dimensions comprising accounting-based measures, market-based measures and external measures. The accounting-based measures include various properties of earnings such as persistence and predictability of earnings (e.g. Dichev and Tang, 2009; Vichitsarawong and Pornupatham, 2015), accruals and earnings management (e.g.

Jones, 1991; Dechow, Sloan and Sweeney, 1995; DeFond and Park, 2001; Park and Shin, 2004); income smoothing (e.g. Barth et al. 2008; Cai et al. 2014) and accounting conservatism (e.g. Penman and Zhang, 2002; Khan and Watts, 2009). The marketbased measures reflect investor reaction to earnings announcements including earnings-response coefficients (e.g. Biddle and Seow, 1991; Teoh and Wong, 1993; Ecker, Francis, Kim, Olsson and Schipper, 2006) and value relevance (e.g. Hung, 2000; Bae and Jeong, 2007). The other measures may take the following forms: earnings restatement (e.g. Chen and Farber, 2008; Kravet and Shevlin, 2010); fraudulent financial reporting (e.g. Johnson, Ryan and Tian, 2009); releases from regulators (e.g Dechow et al. 1996; Beneish, 1999) and internal control deficiencies (e.g Ogneva, Subramanyam and Raghunandan, 2007).

For the purpose of this study, the author uses earnings management measured by abnormal accruals to detect earnings quality. Least managed earnings should result in a good reflection of the true performance of a firm. Abnormal accruals measure more closely reflects the outcome of management's abusive use of discretion in the reporting

process (Ji, Ahmed and Lu, 2015). The characteristic of discretion is associated with both the previous standards, Ghana National Accounting Standards

(GNAS) – of course, these standards were based on the principles-based International Accounting Standards (IAS) – and the new standards, IFRS. Healy and Wahlen (1999) consider presence of earnings management as an indicator of absence of financial reporting integrity. Using abnormal accruals, an accounting-based measure, assists to overcome the concerns often raised against the suitability of market-based measures of quality in emerging markets since these markets are perceived as and tend to be inefficient (Lin, 2012). Moreover, this approach for measuring earnings quality has a lot of empirical support (see Wang, 2006; Hribar and Craig Nichols,

2007; Dechow et al., 2010; Lin and Hwang, 2010, Dichev, Graham, Harvey and Rajgopal, 2013). The next sub-section discusses earnings management and its link to earnings quality.

### 2.1.3 Earnings management and its link to earnings quality

Several authors have defined earnings management from different perspectives. For example, Schipper (1989) describes earnings management as ―…a purposeful intervention in the financial reporting process, with the intent of obtaining some private gain, as opposed to, say, merely facilitating the neutral operation of the process‖. Healy and Wahlen (1999) also consider the earnings management to have occurred ―…when managers use judgement 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‖. Both of these two wellknown definitions – as indicated by Dechow and Schrand (2004) – consider earnings management as opportunistic and

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harmful as the intent is to mislead the user to conclude on the firm's performance as more appealing than it truly is. Thus, in this study, since earnings management seems to hide the true and actual performance from users of account the author regards higher earnings management as an indication of lower earnings quality. This reasoning is consistent with existing literature (e.g. Lo, 2008; Gul, Fung and Jaggi, 2009).

Earnings are usually managed via accruals rather than cash flows component of earnings (Jones 1991; Bergstresser and Philippon, 2006). Accruals are the end product of the application of the concept that the effects of transactions and other business events are recorded when they occur rather than when cash is received or paid. Accruals take both long-term form such as depreciation and amortization charges and short-term form such as changes in inventories, accounts receivables and accounts payables between the ends of two periods. While accrual accounting helps resolve the timing and mismatching problems posed by cash accounting (Dechow and Schrand, 2004) through the application of matching and revenue recognition principles, the former type of accounting offers a larger room of opportunity for manipulation by preparers (Barth et al. 2008; Chambers and Payne, 2011). Accrual-based earnings management reflects the use of discretion opportunistically or otherwise in the selection and application of allowable accounting principle alternatives within the broad latitudes offered by Generally Accepted Accounting Principles (GAAP) (Fields, Lys and Vincent, 2001). The selection and application of the allowed accounting choices may drive both naturally occurring accruals (as expected based on firm's operations) and ―created‖ accruals (unexpected and abnormal) to emerge (DeAngelo, 1986; Jones, 1991; Dechow et al., 1995 and 1996; Dichev et al. 2013). Often, larger values of accruals especially if they are inconsistent with the operational characteristics of the firm are interpreted as posing much information risk due to the amount of estimations that goes into their

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determination (Owens, Wu and Zimmerman, 2014). Thus, the abnormal accruals are considered indicative of earnings management (Healy, 1985; Kothari, Leone and Wasley, 2005).

Whereas the normal accruals are expected to occur in line with the underlying operational economics and external factors, the residual portion of the accrual that is left after taking out the expected portion should have resulted from the management's exercise of discretion that GAAPs offer in treating accounting items. Even though the abnormal accruals may not be bad as they may represent management's conveyance of private information useful to investors (e.g. Siregar and Utama, 2008), they more often produce ex post evidence that exotically suggests that the motive behind their use is opportunistic (e.g. Dechow et al., 1996; Chen, Firth, Gao and Rui, 2006). Accordingly, abnormal accruals represent the most popular method by which researchers construe opportunistic earnings management practice (Man and Wong, 2013).

Several models to decompose accruals into normal and abnormal components have been developed but only the most commonly mentioned ones are discussed. Parsing out abnormal accruals component from its counterpart, normal accruals, seriously began from the work by Healy (1985). The study regards the total accruals deflated by lagged total assets as fully discretionary and thus, a proxy for earnings management. On recognizing the flaw in the two assumptions of equating total accruals to abnormal accruals and constant non-discretionary accruals over time by Healy (1985), DeAngelo (1986) seeks to improve on the maiden model. De-Angelo assumes that the unidentified determinants of —unmanipulated‖ accruals are constant over time, such that abnormal accruals only result when there are differences between the nondiscretionary accruals of current and previous years.  In improving the works done by earlier authors to

separate abnormal from normal accruals, Jones (1991) adopts a regression approach to achieve the same purpose. She argues that changes in a firm's revenue and its level of gross property, plant and equipment at the yearend are innately related to the level of accruals. Hence, the proportion of the firm's total accruals not explained by them should be as a result of management's use of discretion to accrue financial statement items. Changes in revenue are assumed to have a large influence on movements in working capital (current) accruals such as accounts receivables, inventories and accounts payables while level of gross property, plant and equipment affects the movements in non-current accruals including depreciation and amortization charges. Continuing from where Jones (1991) ends it,

Dechow et al. (1995) attempt to build a better model by challenging the former's assumption that both credit and cash sales are non-discretionary in the accrual creation process in both the estimation period and event period. By supposing that changes in credit sales are not non-discretionary, they build a new model that modifies the Jones' (1991) model by adjusting the change in revenue element in the Jones' original work for the changes in credit sales, that is, movements in accounts receivables, in the event period. They suggest that their model carries a better predictive power than the original Jones model. However, McNichols (2001) reckons that in the same way as it is less realistic for taking the whole revenue changes as nondiscretionary in the original Jones model considering all movements in credit sales as discretionary in the modified version is still far from reality.

Dechow et al. (1995) and McNichols (2001) highlight that more or less profitable firms usually are associated with higher level of discretionary accruals and that such firms might be wrongly taken to have managed earnings upwards or downwards respectively more than they have so done. For these, efforts have been made to control for

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performance indicators such as cash flows from operations and return on assets (ROA) in determining the residual accruals. For instance, Dechow and Dichev (DD) (2002) submit a model that regresses working capital accruals on a three period cash flows from operations: past, present and future. The portion of accruals that does not dissolve into the three cash flows is known as accrual estimation error, an indication of poor accrual quality. McNichols (2002) finds a blend of the DD's model and the original Jones model to be a better way of measuring the accrual estimation error. Her model, thus, controls for the three variables in the DD's model and the two in the Jones model. By considering return on assets as a proxy for performance, Kothari et al. (2005) adjust the modified version of Jones model to reduce misspecification errors and biases toward rejecting the null hypothesis of the absence of earnings management when a firm experiences extreme financial performance. Two approaches are adopted by them to achieve their objective. On one hand, they add either a contemporaneous or lagged ROA directly in estimating the residual accruals. On the other hand, they adjust a firm-specific residual accruals by matching each observation with another closest observation in terms of lagged ROA in the same industry.

Admittedly, the Jones models have played crucial role in capturing earnings management. However, a study by DeFond and Park (2001) argues and finds that the use of Jones models is inappropriate in the context of finite sample research. The authors propose a new equation that separates expected portion of working capital accruals from the unexpected portion and use the latter to measure the extent of earnings management. They consider this approach the best way to capture earnings management when the number of observations is too small to fit the Jones type models. Hence, despite the strong predictive powers of the Jones models and their remarkable fame in earnings management literature (Dechow, Hutton, Kim and Sloan, 2012), this

study employs abnormal working capital accruals (AWCA) as the measure of accrual-based earnings management.

AWCA reflects the residual of the total working capital accruals after deducting from total realized working capital accruals the expected working capital accruals computed on the basis of the historical relationship between working capital and revenue (DeFond and Park, 2001). The use of AWCA to measure earnings

management is suitable for this study for the following:

a. Using AWCA helps avoid the ―flimsy‖ assumption of equality of accrual generation process of firms belonging to the same industry which is associated with the cross-sectionally based Jones type models (Owen et al. 2014). AWCA computes the value of abnormal accruals using a firm year specific data rather than industry-based or time-based averages.

b. AWCA is an accounting-based metric of earnings quality. Accounting-based measures seem more appropriate in regions where the use of market-based measures of earnings quality may be inappropriate since markets in these environments are usually inefficient (Lin, 2012).

c. Further, as abnormal or discretionary accruals measure, AWCA is more likely to reflect the outcome of managerial opportunistic behaviour.

d. The small sample size nature of this undertaking makes the use of AWCA very appropriate.

e. The use of abnormal accruals as earnings management measure is very prevalent in extant literature.

The institutional framework which grounds the study is discussed next.

## 2.2 Institutional framework

The section deals with various structures that may serve as incentive for corporate disclosure and transparency or otherwise among Ghana's listed firms. As Ball, Robin and Wu (2003) indicate, financial reporting is shaped by more incentives than just accounting standards. To this end, the author considers the following sources of incentives relevant in shaping firm-level reporting practice in a single country, Ghana: a) Ghana's capital market development; b) financial reporting regulation for Ghana's listed firms; c) concentrated shareholding among listed firms; and d) board composition of the listed firms

### 2.2.1 Ghana's capital market development

In its quest to become a capitalist state, Ghana among other things resolved to widen up the scope for the private sector to gain access to capital by creating a stock market. Formed in 1990, the GSE has grown from a starting number of 11 listed firms to 35 firms in 2014 (Ghana Stock Exchange Website). The setting up of a capital market pushed into reality the serious attempts made in the 1980s to turn Ghana into marketbased economy (. Various privatization moves as part of wide economic reforms were launched with the aim of ending the poor management of state resources and this move was facilitated by the formation of the stock market. As noted by Tsamenyi, Enninful-Adu and Onumah, (2007), majority of the companies listed on GSE were listed through a privatization process. This may suggest that ties with government may still subsist as in the case of China (Ding et al., 2007). This gives an indication that different forms of ownership characterize listed firms.

**Figure 2.1 GSE performance: total volume and value traded from 1990 – 2013**
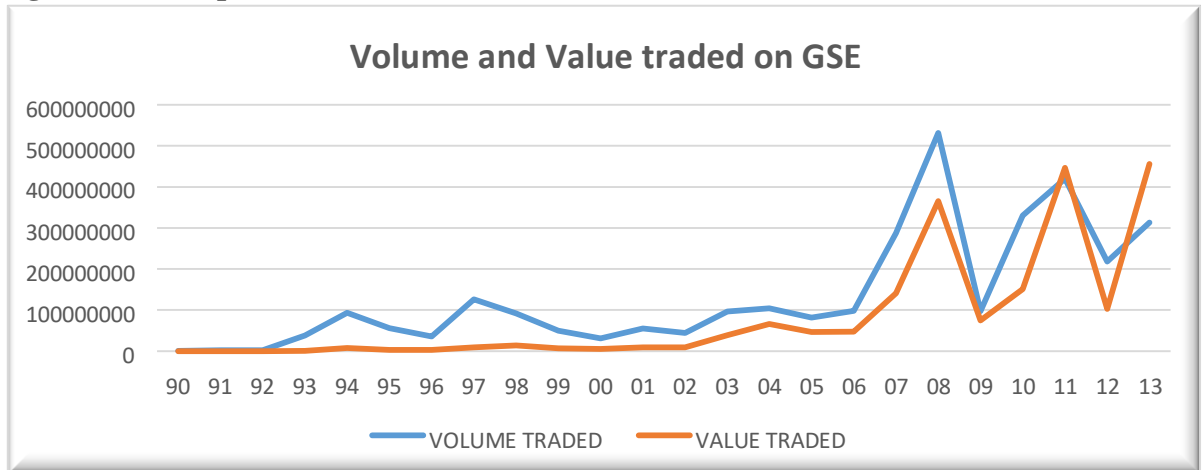


*Source: GSE Market Report, 2013*

**Figure 2.2 GSE performance: total market capitalization from 1990 – 2013**



*Source: GSE Market Report, 2013*

The use of public and equity market is regarded as an indication of transition of an economy towards the capitalist economic structures similar to those of the UK and the US where demand for transparency is high. Moreover, the GSE allows both local and foreign-controlled firms to gain listing status.

GSE has had some impressive outturns over the years. In 2004, the GSE became the world's best performing stock market with an annual return of 144% in US$ terms relative to a global average index of 30% (DataBank Group, 2004). From Figure 2.1 above, it can be seen that the total volume and value traded on the GSE since inception

up to 2013 have shown reasonably good trends. Both starting from near zero, but as at 31st December, 2013 the volume and the value have respectively reached over 30million and GH¢45million. Figure 2.2 also shows that as at 31st December, 2013, the total market capitalization of GSE has risen up to more than

GH¢60 billion making the market one of the largest within the Sub-Saharan region of Africa in terms of market value (not in terms of number of firms) (Adda and Hinson, 2006). This may be due perhaps to the presence of large firms such as AngloGold Ashanti Limited and Tullow Oil Plc. The somewhat impressive outturn of the Ghana's capital market renders corporate disclosures very necessary. For the few players trading on the exchange, Tsamenyi et al. (2007) describe GSE as a highly concentrated market they indicate that the sum of the market values of the four largest players on the market occupies about 77.95% as at 2002 year-end.

The stock market faces a number of challenges despite its good performance over time as discussed above. There seem to be weak institutional foundation, issues regarding capacity and apparent gaps in enforcement that need to be addressed to meet the required standard of performance (Senbet and Otchere, 2006). The low enforcement force may be an indication that the strength in financial reporting among the firms could be called into question. Hence, even though quality reporting is required in Ghana the lax enforcement may suggest low informativeness of earnings. Moreover, GSE lags behind many similar capital markets in such African contexts as Egypt, Kenya, Namibia and South Africa in terms of the number of listed firms (DataBank Group, 2004). The next sub-section discusses how financial reporting among Ghana's listed firms is regulated.

## 2.2.2 Financial reporting regulation for listed firms in Ghana

Ghana, being a British former colony, has a common-law legal system built on the legal system of its colonial master (Assenso-Okofo et al., 2011). According to Lopezde-Silanes (2003), countries with this legal framework are oriented towards quality reporting and disclosure. These settings tend to also have various provisions which ensure that transactions are carried through between or among different independent parties (because the system emphasizes decentralization of activities as opposed to the state being responsible for transactions). Hence, high level of disclosure becomes mandatory in such contexts. To this end, accounting environment of firms in Ghana including listed ones has been shaped by the reporting practices of the UK. Importantly, the issue of financial reporting and accounting in Ghana has been deemed to have taken its serious course post-promulgation of the Institute of

Chartered Accountants, Ghana (ICAG) in 1963 by Act 170 (Assenso-Okofo et al., 2011). From 1963 up to date, the main legal framework for financial reporting and auditing for both private and public companies has been derived from the Companies' Code (Assenso-Okofo et al., 2011). Apart from the Code, the GSE listing rules had required all listed firms to comply with GNAS until the adoption of IFRS in 2007 (*www.ifrs.org*).

Following various recommendations submitted by World Bank's Report on Observance of Standards and Codes (ROSC, 2004) to improve upon the financial reporting practices in Ghana, the country in 2007 announced its decision to adopt IAS/IFRS. The adoption strategy, as suggested by eleven-member task force drawn largely from auditing firms, was among other things ―wholesale‖ adoption of the global standards to replace the local standards entirely. The move to adopt principlesbased IFRS was meant to enhance

the standard and quality of financial information produced by firms. All listed firms, banks, insurance companies and all public utilities were initially mandated to switch from using the local standards to using the IFRS in preparing their financial statements (GNA *Business and Economics*, 2006). These entities had from January 1, 2007 up to December, 31 2008 to take such action

(www.ifrs.org). For this liberal provision within the Ghana's IFRS adoption agenda, some firms might report using the local standards while others the IFRS in 2007. The mandatory adoption of IFRS is expected to result in substantial impacts on financial reporting practices among firms since the IFRS are meant to rectify several deficiencies in the previous national GAAP. The next sub-section compares the IFRS with the GNAS to point out the deficiencies that IFRS have been adopted to fix. The discussion will consequently show why the change from GNAS to IFRS is considered dramatic and hence, expected to influence reporting practices.

**How divergent are GNAS from IFRS?**

Until 2009, the practices of financial reporting in Ghana had been guided by GNAS which were meant to reflect IAS (ROSC, 2004; Assenso-Okofo et al., 2011). The report reveals that even though the local standards were meant to be IAS-based accounting standards they contained a lot of outdated versions of the IAS as they had remained unrevised since 1999. It indicates further that the Institute of Chartered Accountants, Ghana (ICAG) and the Ghana National Accounting Standards Board

(GNASB) were neither incorporating new revisions to the ―mother‖ IAS into the local standards to bring them to currency. ROSC (2004) identifies many deficiencies that had plagued the local standards for which reason the introduction of the IFRS (which are meant to overcome those weaknesses) is expected to result in improved financial

reporting. The following differences between the two accounting standards are discussed:

a. The development, revision and implementation of IFRS are based on the full provisions of the International Accounting Standards Board (IASB)'s conceptual framework while the domestic standards relied on a few of those provisions.

b. The domestic standards did not have requirement for statement of changes in equity as required by IAS 1 *Presentation of financial statements.* The Companies' Code however requires the preparation of income surplus and capital surplus accounts.

c. In dealing with changes in accounting policies between periods, the domestic standards only required certain specific changes to be incorporated in the current period as extraordinary items whereas the IFRS requires a more comprehensive treatment including retrospective applications.

d. Minority interest line was not required in the income statement by the domestic standards; IAS 1 *Presentation of financial statements* requires that comprehensive income attributable to non-controlling interest is shown in statement of comprehensive income.

e. The domestic standards required deferred tax assets and liabilities to be accounted for in respect of only temporary differences due to depreciation but the IFRS require firms to account for deferred taxes for all timing differences

f. The domestic standards did not have any requirement for reporting on segment-tosegment basis but IFRS 8 *Operating segments* requires firms to provide segmental information relating to revenue, expenses, results, assets and liabilities

g. There was no requirement for capitalizing borrowing costs under the domestic standards as IAS 23 *Borrowing costs* does with IFRS firms. (see Assenso-Okofo et al. 2011)

Beyond these apparent divergences in the provisions of the two accounting standard sets, is the **outright absence** of equivalent GNAS to IFRS including:

a. IAS 19 *Employees benefits*;

b. IAS 32 *Financial instruments: disclosure and presentation (*now deals with presentation alone while disclosures are guided by IFRS 7 *Disclosure*);

c. IAS 33 *Earnings per share*;

d. IAS 34 *Interim financial reporting*;

e. IAS 35 *Discontinued operations* (now IFRS 5 *Non-current assets held for sale and discontinued operations*);

f. IAS 36 *Impairment of assets*;

g. IAS 37 *Provisions, contingent liabilities and contingent assets*;

h. IAS 38 *Intangible assets*;

i. IAS 39 *Financial instruments: recognition and measurement* (to be replaced fully in 2018 by IFRS 9 *Financial instruments*); and

j. IAS 41 *Agriculture*.

This highlights the extent of deviation between the two standard sets. Consequently as would expect, the financial information produced on the basis of the globally acclaimed and high-quality IFRS should lead to improved financial reporting quality in Ghana (Burgstahler, Hail and Leuz, 2006; Houqe, van Zijl, Dunstan and Karim, 2012; Cai et al., 2014). The level of absence of equivalent standards is too pronounced to afford one not to refuse to harbor pessimism regarding the positive impact that IFRS adoption can

have on accounting quality among adopting firms in Ghana. This reasoning is confirmed by Nobes (2001) who reports that significant improvement in quality only occurs for firms which are based in regions where absence is remarkable. Higher quality is even more expected given that Ghana has fully adopted all the standards without any modifications (*www.**ifrs**.org*).

It is important to emphasize that both the local standards (IAS-based standards) and the IFRS are principles-based. Hence, they are characterized by accounting conservatism and discretion by the presence of accounting choices such as provisions and reversals, choice of depreciation method and useful life of non-current assets (Fields et al., 2001; Barth et al., 2008). This feature therefore justifies the appropriateness of applying discretionary (abnormal) accrual method in measuring earnings management in this study. Thus, the effects of the IFRS adoption in improving quality using the quality of reported earnings proxy are explored in Ghana's context in this study. The variations in ownership and board structures as discussed below also permit the study to examine the role of firm-level incentives in shaping financial reporting along with the remarkable revision in Ghana's accounting regulations. The next sub-section discusses shareholding structure (concentrated shareholding) of listed firms in Ghana.

### 2.2.3 Concentrated shareholding among listed firms in Ghana

Firms listed on the GSE are characterized by high level of concentrated shareholding usually by institutional investors including the state, multinationals (belonging to large group) and local individuals and institutions (Mensah, 2002; Tsamenyi et al. 2007; Greif, 2012; Abor and Ogeh Fiador, 2013; Agyemang and Castellini, 2015). A few decades ago, almost every firm in Ghana was under state control but now private ownership has gained notable presence. Agyemang and Castellini (2015) mention that

state-owned enterprises have often been characterized by poor performance a situation which has prompted governments over the years to undertake responsive measures including privatization of these firms.

Tsamenyi et al. (2007) document that majority of the companies listed on GSE were listed through a divestiture process as part of shifting ownership from inefficient ―government machineries‖ of state-owned enterprises to private investors under the Economic Recovery Programme (Agyemang and Castellini, 2015). This required the government of Ghana to dispose some fraction or the whole of its holding in the companies in question to other investors (who could be individuals or institutions) in accordance with the GSE listing rule. The rule mandates that more than twenty-five percent of a company's shareholding should be in the hands of the public prior to quotation. The idea of privatization still led to block control but in different forms including foreign or locally private investor block control. This was the case because the disposal of the holdings of government was executed in blocks rather than on dispersed basis. However, GSE allowed the state to still own up to 75% (at least 25% holding need to be offloaded to private owners). This indicates that the privatization programme could and did not rip off the state of its influence so much in corporate matters in Ghana (Mensah, 2002 and Tsamenyi et al. 2007).

Empirically, Greif (2012) shows that an average non-financial or non-cross-quoted firm trading on the GSE has around 74% of its shares held by blockholders and a Herfindahl concentration index of 0.37. He further reveals that there are controlling shareholders in about 58% of the total firm-years observed; clearly this indicates that there is high degree of shareholder concentration. In the study, he pays much attention to state ownership even though he also observes the presence of large foreign and local

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investors. He measures government's holding by summing up government's direct investment activities (such as retention of interest in previously non-listed stateowned enterprise by Government of Ghana and its Ministry of Finance) and indirect holdings held through government/state linked bodies such as Ghana Cocoa Board, Social Security and National Insurance Trust (SSNIT), state-controlled financial institutions such as Ghana Commercial Bank and Agricultural Development Bank, among others (Greif, 2012). Again, a recent multiple case study conducted by Agyemang and Castellini (2015) to examine and understand corporate governance practices in Ghana reveals that each of the four case companies studied has a single controlling shareholder. It is this evidence of the presence of controlling shareholders in Ghana that has motivated this study to investigate into its effects on financial reporting process in Ghana. Types of controlling shareholders are also looked at in the study. The next sub-section discusses the board structure of listed firms in Ghana.

### 2.2.4 Board composition of listed firms in Ghana

According to Adda and Hinson (2006), the relevant provisions which affect the structure of corporate boards of listed firms in Ghana are contained in at least four legal and regulatory documents. These include the Companies' Code, 1963 (Act 179), the Securities Industry Law, 1993 (PNDCL 333) as amended by the Securities Industry (Amendment) Act 2000 (Act 590), the Security and Exchange Regulations, 2003, LI 1728, and the Ghana Stock Exchange Listing Rules and Regulations. These are augmented by the Security and Exchange Commission's 2010 Code of Best Practices (see Agyemang and Castellini, 2013).

The Companies' Code stipulates that the business of the company should be manned by the board of directors unless this is inconsistent with the company's own regulations

(Bokpin, Isshaq and Aboagye-Otchere, 2011). Company boards have legal responsibility for financial reporting in Ghana. Specifically, a company's board is required by the Section 131 of the Companies' Code to give approval to the annual accounts prior to their publication where a signature of two members on behalf of the board is required before such publication happens (Adda and Hinson (2006). Thus, the board is placed in a position to positively and actively monitor the whole process of financial reporting. The effective performance of such role will much depend on the independence and competence level of the governing board. The Companies' Code gives various powers to the board to discharge its duties (Adda and Hinson, 2006). Independent outside directors play critical role in ensuring that the legal and social mandate of the board is fully carried through making their presence on the board non-optional.

The blend of insider and outside directors on the board has been highly regarded as an important element of good corporate governance (Fama and Jensen, 1983). The Code does not specify the composition of the board as to appointment of non-executive directors neither does it contain any requirements for the balance of inside and outside directors. The Code however, contains provision that an officer can at the same time be appointed as director; hence, allowing executive directors to represent on the board. The SEC's Code of Best Practices clearly mandates listed firms on the GSE to include independent directors in the board membership. Moreover, GSE Listing Rules stipulate that at least 50% of the directors should be non-executive; from 2006, the revised Listing Rules require 25% of the total board membership not only to be nonexecutive but independent as well. Empirically, Aboagye-Otchere, Bedi and Ossei

Kwakye (2012) and Abor and Ogeh Fiador (2013) find the proportion of external directors on the board in Ghana to be around 63% and 73% respectively. The findings reaffirm high reliance put on outside directors among listed firms in Ghana.

While all other provisions do not expressly require firms to share the powers of the CEO and the board chair, the SEC's 2010 Code does. For instance, while Section 193 of the Companies' Code stipulates that board from time to time should appoint a managing director to steer the business and executive affairs of the company it does not make any attempt to prohibit a single person from picking up the dual role. Since the 2010 Code of Best Practices occurs within the study period, the study results may be driven by such regulatory change as well. Apart from telling listed firms to split the two key roles, it also calls on them to exert more independence on the entire board by appointing a lot more outsiders. These changes, rather than the IFRS introduction, may then perhaps cause boards to be more effective in dealing with earnings management. The study attempts to minimize these effects using an alternative dataset that limits the period to up to the end of 2010 since the Code came in near the end of the 2010 (Agyemang and Castellini, 2013). Unlike the introduction of IFRS however, this regulatory change is not expected to bring any dramatic reforms in the governance arrangements of firms as firms already have high outside representation and resounding level of CEO/chair separation (see Abor, 2007). Independence definition is also far from being straight to point while enforcement of these structure looks very doubtful (Agyemang and Castellini, 2013). Thus, the level of effectiveness or otherwise of boards may not change discernibly by the code.

Lastly, the Companies' Code identifies that the appointment and removal of company directors should be guided by what is enshrined in the company's regulation and should

be the prerogative of the voting shareholders (Bokpin et al., 2011). Each share is entitled to a voting right and a decision is made mostly by an ordinary resolution which requires a simple majority. This implies that in a case where a shareholder holds more than 50% of the voting shares of a firm that single voter's choice of who gets appointed unto the board becomes the firm's decision. At this point, it becomes obvious that many of such decisions may occur in a good number of firms in Ghana given the existence of high level of concentrated and controlling ownerships. These are the issues considered for the study. The next section deals with the applicable theories.

## 2.3 Theoretical framework

This section discusses the relevant theories on which this study is built. The theoretical framework underscoring this research is defined by a) transparency argument; b) incentives versus accounting standards hypothesis; c) agency theory; and
d) monitoring versus expropriation hypothesis

### 2.3.1 Transparency argument

Ghana is regarded as a common-law country. A common feature of such regions is the involvement of many agents in transactions and this requires that a great deal of accurate and detailed disclosure of information is made. Within the corporate world, parties such as management and inside directors usually have an edge over many other parties when it comes to access to information. This situation of information advantages and disadvantages leads to a corporate finance concept of information asymmetry. This may be a situation where management either release right amount of information of low accuracy or refuse to provide the information at all to the other parties. This issue has also been an issue for standards setters, especially the IASB.

The concern of the IASB is to develop and revise standards to ensure that the information supplied to the user has at least such qualities as relevance, reliability and faithful representation. It is hoped, therefore, that IFRS will reduce these information asymmetries and inadequacies.

Proponents of transparency argument posit that information asymmetry may decline because it is believed that the use of IFRS should lead to improved transparency, that is, financial reporting quality (Barth et al., 2008; Daske et al., 2013; Cai et al., 2014; Ta, 2014). At least three reasons have been suggested to explain why improved transparency or reduced asymmetry is expected from IFRS. First, it is argued that IFRS are more principles-based standards than domestic standards. This makes it less likely to circumvent these requirements. Second, IASB have taken steps to restrict allowable accounting alternatives in order to minimize manager's opportunistic discretion in the reporting process and also require reporting measurements that allow for a better reflection of a firm's economic position and performance (Barth et al., 2008). Third, the prevalent use of fair value accounting under IFRS is expected to result in higher accounting quality.

## 2.3.2 Reporting incentive versus reporting standards argument

On one hand, there is a general belief that mandating IFRS should lead to enhanced transparency and /or enhanced comparability of financial reporting practices across countries (Barth et al., 2008; Ahmed, Neel and Wang, 2013). On the other hand, there are also reasons why one may also doubt the ability of IFRS to result in such positive outturns as discussed above. At minimum, two reasons are offered. First, IFRS may make no impacts on reporting quality or even reduce it if restricting the extent of

reporting discretion leads to elimination of such accounting alternatives that are most appropriate for communicating the underlying economics of a business (Ta, 2014).

Second, compared to rules-based standards like the US GAAP principles-based IFRS are characterized by a reasonable level of reporting flexibility (Langmead and Soroosh, 2009). IFRS do not necessarily have detailed and precise implementation guidance for all of the provisions; this, thus, affords opportunistic managers to exploit the discretion to their private benefits (Leuz et al., 2003). Thus, it is not straightforward to assert that IFRS adoption should necessarily lead to improved information environment.

Even if it is accepted that IFRS are likely to result in improved quality, studies have indicated that the improved quality does not happen because of the IFRS adoption *per se* but by the interaction of the standards with market and firm-level incentives (Ball et al., 2003; Daske et al., 2008; Daske et al., 2013; Ahmed et al., 2013). Whereas market-wide incentives may often relate to the strength of enforcement structures, tax regimes, divergence between local GAAP and IFRS ownership structure and legal origin (Ball et al., 2003) firm-level incentives may cover compensation and financial arrangements, ownership structure and governance mechanisms (Dechow et al., 2010; Ta, 2014). Market-wide institutional structures are usually considered in crosscountry studies; however the author pays some indirect attention to two of them. The first one is the strength of enforcement structures; the reason is that the effectiveness or otherwise of enforcement mechanisms will have direct effect on the extent to which the standards are substantively and rightly applied. The second is the divergence between local GAAP and IFRS; the reason is that if IFRS widely reduce or increase the quality of standards then the impact may be seen anyway. Firm-level structures considered are ownership structure and corporate governance.

IFRS researchers (e.g. Ball et al., 2003; Burgstahler et al., 2006) seem to agree that reporting incentives of managers do play key role in the determination of reporting outcomes. For example, Ahmed et al. (2013) document no IFRS effects for firms domiciled in weak enforcement environment while Cai et al., (2014) report that firms in jurisdictions where divergence between standards is wide experience improved quality even if enforcement mechanisms are not strong. At firm-level, for instance, Marra et al. (2011) find firms with more independent boards to experience greater reduction in earnings management. Firm-level differences in incentives from corporate governance may still play crucial roles in shaping reporting outcomes in environments with suspicious enforcement structures and weak investor protection

(Leuz et al., 2003) such as Ghana (Assenso-Okofo et al., 2011; Agyemang and Castellini, 2015 ).

### 2.3.3 Agency theory

The agency theory owes its genesis to the work of Berle and Means (1932) as cited in Ding et al. (2007). The seminal paper advocates that in a situation where there is separation between ownership and control of a firm it creates tension as the manager (who is the agent) being inclined to fulfill his own ambition may act in a way that is inconsistent with the pursuit of the interest of the owner (the principal). This leads the latter to incur costs in his/her quest to get to resolve the resultant agency problem. The struggle degenerates even further where the dispersion in shareholding widens up along with increased information asymmetry between the two parties causing the agent to have larger room to advance his/her selfish desires to the detriment of outside shareholders (Berle and Means, 1932, cited in Ding et al., 2007; Jensen and

Meckling,1976). The effects of such negative behaviour are often hidden from the principal's attention by the agent through financial reporting manipulation.

Clearly, the principal must act to protect his interests by arranging up measures to confront the situation. These measures may be to set up packages such as performance-tied compensation schemes and promises of turning the agent into principal in future by way of providing managerial share options in order to align agent's interests with the principal's. The shareholder may put in place appropriate oversight and monitoring structures such as constituting a board to distinguish between decision management and decision control (Fama and Jensen, 1983) and hiring external assessors to help supplement the value creation efforts and/or exert value protection efforts of the entire firm (Dechow et al., 2010).

The agency problem above is what is known as Type I agency conflict. The variant type is referred to as ―Type II‖ conflict which occurs between controlling/majority shareholders and minority shareholders. This conflict type is more prevalent in most countries across the world (Shleifer and Vishny, 1997, La Porta, Lopez-de-Silanes and Shleifer, 1999; Claessens, Djankov, Fan and Lang., 2002; Ding et al., 2007). Of course, the shareholding structure on the GSE is no exception to this (Agyemang and Castellini, 2015). The conflict is driven by a situation where there is a single controlling shareholder or a few shareholders with block-holdings who resolve to extract private benefits from the firm to the detriment of those with minority interests (Shleifer and Vishny, 1997; Liu and Lu, 2007). In such a case, there is the need to strengthen legal structures to protect and preserve the rights of minority investors (Agyemang and Castellini, 2015). Such provisions would exist in Ghana if they were applied and properly enforced (Agyemang and Castellini, 2015). Notably, the absence of such

measures leaves the minority shareholders at the mercy of the controlling few who might tunnel benefits out of the firm and mask the resulting financial reporting effects through such techniques as real transaction and accrual manipulations. This tension is found to be much higher if the state holds the controlling interest (Liu and Lu, 2007; Ding et al., 2007; Fan, Wei and Xu, 2011). However, some authors argue that undiffused ownership or controlling shareholder presence reduces Type I conflict by serving as a monitoring device in the absence of weak investor protection (Shleifer and Vishny, 1997; Leuz et al., 2003) rather an entrenchment instrument (Greif, 2012). These conflicting issues are discussed next.

## 2.3.4 Entrenchment/expropriation versus monitoring/alignment hypothesis

It is often argued in literature as to whether the presence of concentrated ownership or controlling shareholder is a blessing or curse. Put differently, does the existence of large shareholding by a few owners or single owner result in better monitoring or extraction of private control benefits one of which may include information hiding.

In explaining these matters, Ding et al. (2007) put forward these hypotheses regarding the relationship between ownership structure and earnings manipulation. These are the entrenchment propositions. The first relates to the adverse effect of concentration on the agency problem. By building on the research carried out by Morck, Shleifer and Vishny (1988), they contend that enhanced shareholding by controlling holders leads to entrenchment against the impacts made by minority shareholders. In cases where the expropriation efforts by entrenched controlling owners result in withered actual earnings, they attempt to keep them in the hindsight by withholding unfavourable information (to increase earnings).Thus affecting the quality of reported accounting numbers including earnings is adversely affected.

The alignment or monitoring hypothesis is anchored on the theory that shareholding concentration brings down the costs created by agency problem, by aligning the interests of controlling shareholders with those of the firm. Large shareholders play an active role in internal control of companies, because the quantum of participation or ownership stake and level of cash flow rights encourage them to monitor the actions of managers effectively. Evidence on this belief is offered to indicate that high ownership concentration is a signal of the controlling holder's commitment to build reputation for not extracting private benefits from the firm. Therefore, the alignment effect thinking suggests a greater ownership concentration should, according to efficient monitoring hypothesis (Jensen and Meckling, 1976), result in a reduced opportunistic behaviour and enhanced potential to maximize the wealth of the firm (Fama and Jensen, 1983). While the expropriation effect indicates that earnings manipulation rises with concentration, the monitoring effect asserts that concentration depresses earnings management. Researchers are yet to find an unequivocal support for either since evidence so far has been mixed. The review of prior empirical findings and methodologies is presented next.

## 2.4 Review of prior empirical studies and hypotheses development

In discussing previous empirical research related to the study objectives, the author divides the section into four sub-sections: a) the implications of IFRS adoption for earnings quality; b) association of controlling shareholding with earnings quality; c) association of outside directorship with earnings quality; and d) the interrelationships between IFRS adoption and firm-level governance mechanisms in influencing earnings quality. These issues are discussed below:

## 2.4.1 The implications of IFRS adoption for earnings quality

Transparency argument posits that IFRS should cause asymmetry of information to reduce. The reasons that are often cited are that IFRS are higher quality standards and tend to bring out more comparable financial information produced by firms within and across industries and countries. In particular, Ashbaugh and Pincus (2001) and Barth et al. (2008) submit that international accounting standards are superior to the domestic standards of several countries because IFRS demand more disclosure and restrict alternative measurements and recognition of items. Consequently, as Bushman and Smith (2001) argue, IFRS should be able to constrain managerial discretion by enhancing user's ability to monitor managers.

The question of whether an emerging economy reaps any benefits of say enhanced quality or transparency from IFRS adoption is still an empirical issue. The doubt may subsist because: a) emerging economies, including Ghana, are largely influenced by coercive and mimetic isomorphic reasons (Kossentini and Othman, undated) to adopt IFRS; b) IFRS are typically developed for advanced market-oriented economies (Prather-Kinsey, 2006); and c) emerging economies often lack strong enforcement structures to enforce compliance with the standards. Confirming this belief, Lin (2012) finds support for his argument that developing and less developed countries such as Kenya often comply with IFRS just in —form‖ rather than in —substance‖ and hence, no real economic benefits are expected to accrue to firms in such jurisdictions. From another African context, Elbannan (2011) also finds no improvements in accounting quality via reduction in earnings management and increased timeliness in loss recognition in Egypt following convergence of Egyptian Accounting Standards with

the International Accounting Standards (IAS). This might have resulted because the convergence did not lead to significant changes in the Egyptian Accounting Systems.

Quite surprisingly, from a more advanced setting, Paananen (2008) reports reduction in accounting quality in Sweden following the IFRS adoption by the European Union in 2005. The results could be driven by the notion that in the Scandinavian countries more reliance is placed on credit financing than on equity financing as it is the case for countries of code-law origin making market-based IFRS less likely to serve any useful purpose. Moreover, findings of a study by Ball et al. (2003) indicate that it is not sufficient for a country to improve its financial information environment just by switching to a high quality accounting standards since the incentives of firms to disclose quality information play an all important role in such pursuits. Similar findings are reported by Paananen and Lin (2009) from developed German context. Atwood, Drake, Myers and Myers (2011), who measure earnings quality by earnings persistence and the ability of reported earnings to predict future cash flows, report no evidence of improved earnings informativeness following IFRS adoption in 33 countries. Their results actually indicate that earnings reported under IFRS are neither more nor less persistent and are no more or less able to predict future cash flows than those reported under domestic GAAP.

In partial contrast, Cai et al., (2014) who investigate 128,292 firm-year observations across the 31 countries (excluding Ghana) reveal that earnings management (earnings quality) has reduced (increased) following adoption but this occurs only in those jurisdictions with wider divergence between previous GAAP and IFRS and with weak institutional structures. Their findings of improved quality are consistent with many similar studies such as Leuz et al. (2003), Türel (2009), Iatridis and Rouvolis

(2010), Chen, Tang, Jiang and Lin (2010) and Chalmers, Clinch, and Godfrey (2011). Using 10 European countries, Santana, Sarquis and Rathke (2015) find that IFRS adoption in these countries has had significant and positive impact on earnings quality. In particular, they report of increased predictive power of earnings components in the post adoption era. Some evidence of improved reporting quality has been found from emerging economy settings. For instance, Ismail, Kamarudin, van Zijl, and Dunstan (2013) find evidence of increased value relevance of IFRSbased earnings and reduced discretionary accruals from Malaysian setting. From a closer setting of Kenya, Bova and Pereira (2012) report findings of enhanced share turnover for more IFRS compliant firms that trade on the Nairobi Stock Exchange. It does seem so far that, evidence on the effects of IFRS adoption in all settings whether developed or developing economies has not been conclusive. Further, it has become apparent that the effects of accounting standards may be more dependent on the strength of structures of the adopting country, disclosure needs of the country and the divergence between previous GAAP and IFRS rather than on whether the country is developed or developing.

Given that disclosure level among Ghanaian listed firms marginally improved postIFRS (see Bokpin, 2013) and the fact that the evidence from Kenya, a similar economy as Ghana, is only present in firms with high foreign shareholding (see Bova and Pereira, 2012), it may be appropriate to predict that there has not been any significant improvement in earnings quality for listed firms in Ghana. However, it is conjectured there has been improvement in earnings quality after IFRS adoption for the following three reasons. First, Cai et al. (2014) report earnings quality improvement for those countries that were characterized by pronounced divergence of their old standards set from the new standards set (IFRS) at the time of the switch.

ROSC (2004) reports several deficiencies in the hitherto Ghana's domestic accounting standards prior to the adoption of IFRS in 2007. Critically, Assenso-Okofo et al. (2011) observe that IFRS differ gravely from and seem better than GNAS in terms of quality, demands and coverage. Second, Ding, Hope, Jeanjean and Stolowy (2007) discover that a high level of absence in domestic standards relative to IAS negatively affects earnings quality. Evidence is documented about the absence of equivalent GNAS to IFRS in many reporting areas (Assenso-Okofo et al., 2011). Third, the conjecture would seem appropriate if one were to give a critical attention to the argument advanced by Hirshleifer and Teoh (2003) that reporting firms acknowledge that users usually pay more attention to the figures in the accounts than to the information contained in the footnotes. Understanding obtained from such argument leads to a point that perhaps the firms pay much more attention to the figures themselves rather than disclosure.

*H1: Ceteris paribus, IFRS adoption has resulted in subsequent improvement in earnings quality*

**2.4.2 Association of controlling shareholding with earnings quality**

Extant literature offers evidence on the association between the presence of large shareholding and quality of earnings. So far, the evidence has been mixed. On one hand, studies have shown that high concentration of ownership often leads to entrenched behaviour (Stulz, 1988). Often times, the prevalence of bulky shareholders leads to a shift from the conflict between outside shareholders and managers to a less traditional tension between large shareholders and small shareholders (La Porta et al., 1999). Entrenched controlling shareholders are less subject to stock market discipline and governance input by minority shareholders, and thus, have substantial discretion in advancing their own interest to the harm of the minority owners. Since the same owners

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control the preparation of financial statements, they will attempt to hide the firm's real economic performance by inflating profit (for share price appreciation reason, for example) or deflating profit (for denying the minority shareholders of dividends, for example). Leuz et al. (2003) lend support to this belief by observing that there are higher earnings management practices for firms based in environments with relatively more concentrated ownership, weaker investor protection and less developed markets than their counterparts across 8000 firms based in 31 countries. Halioui and Jerbi (2012) provide similar results from an emerging country using a single country analysis based on 257 Tunisian firm-year observations. They find that firms controlled by blockholders manage their earnings more than those with more dispersed ownership structure. In Ghana's context, by using panel dataset for firms listed on the GSE covering a period from 2000 to 2010, Greif (2012) finds strong evidence for the risk of shareholder expropriation, but only limited evidence for the monitoring value of large shareholders.

On the other hand, concentrated ownership is expected to restrict agency costs because the more shareholding becomes concentrated the more interested large shareholders seem to be in maximizing profit and controlling the resources of the firm to have their interest honoured (Shleifer and Vishny, 1997). This desire discounts the controlling owner's incentive to expropriate wealth from the firm against the minority shareholders (Ding et al., 2007). Bos and Donker (2004) offer a supporting evidence to this alignment effects of concentration as they report that the presence of blockholding enhances financial reporting credibility and earnings quality efforts by exerting active monitoring and control over the reporting process. A few more studies also show a positive relationship between concentrated shareholding and improved financial reporting quality (e.g. Fan and Wong, 2002; Burgstahler et al., 2006). Evidence from Korea also

points to the controlling shareholding creating more incentive to restrict managerial discretion (Jung and Kwon 2002). This supports the active monitoring role of controlling owners.

Different types of shareholders with high level of holdings have been found to have varying relationships with financial transparency. By comparing how earnings management practices vary between state-controlled versus private-controlled companies from the Chinese context, Ding et al. (2007) report that privately controlled firms are more inclined to abuse accounting discretion. The findings then question the validity of general belief that state-owned enterprises are indiscriminately bad firms. However, other authors, who argue that for the incessant government's intervention in the state-controlled firms and the belief that these firms suffer due to high level of corporate inefficiency and huge corrupt practices, find that agency costs of information risk usually increase with state-controlled firms relative to others. For instance, Firth, Fung and Rui (2007) find evidence that suggests that earnings of statecontrolled firms are less informative. Literature exists on the impact of firms with foreign portfolio holdings on the quality of financial reporting (Chen et al., 2006; Gopalan and Jayaraman, 2012). The two studies provide evidence that foreigncontrolled firms are characterized by lower level of information risk since the foreign parent firms usually have adequate resources human and otherwise that enable it exert sufficient control over operational and reporting decisions. Meanwhile, literature also indicates that in cases where firms are owned by business groups the risk of expropriation often through related party transactions among group members increases. The desire to hide the effects of non-arm's length transactions creates incentive for the parent firm to obscure the firm's true economic performance by manipulating earnings (Siregar and Utama, 2008).

From the arguments above, it can be observed that the effects of controlling shareholding on earnings quality are yet far from being empirically settled. Moreover, the large shareholders in Ghana are dominated by the state and multinationals both of which do not have a mono-direction in terms of the relationship between concentration and earnings quality. Hence, there remains ambiguity with respect to such relationship prior to the empirical analyses. This leads to the second hypothesis.

*H2: Ceteris paribus, there is an association between controlling shareholding and earnings quality.*

### 2.4.3 Association of outside directorship with earnings quality

In line with prior literature, outside directorship is considered from two perspectives: the proportion of outside directors on the corporate board and absence of CEO/Chair duality since these two governance mechanisms have been pointed as key to constrict management's earnings manipulation efforts (García-Méca and Sánchez-Ballesta, 2009). Providing oversight over financial statements preparation as company board is one of the legal responsibilities prescribed by the Companies Code for directors in Ghana (Mensah, 2002). It is expected that more effective board monitoring comes about when more external members serve on the company board because outside directors are not linked to the management team over which they exercise oversight (Karamanou and Vafaes, 2005; Chen and Courtenay, 2006).

Even though quite a number of studies do not present supporting evidence for the monitoring role of outside directorship such as Park and Shin (2004) who find no reduction in earnings management for firms with more independent board, many studies do find such evidence. This is especially so from less ownership concentrated

settings (Gonzalez and Garcia-Meca, 2014). Results from both systematic literature review and meta-analysis of corporate governance studies strongly affirm that a greater level of board independence often results in better control over management's activities including the preparation of financial reports (García-Meca and SanchezBallesta, 2009). Empirical studies by Xie, Davidson and DaDalt (2003), Davidson, Goodwin-Stewart and Kent (2005), and Jaggi, Leung and Gul (2009) all provide evidence that there is an inverse relationship between the proportion of non-executive (independent) directors on the board and earnings management practices. In addition to finding that the firms with more outside directors restricts manipulations through share repurchases, Farrell, Yu and Zhang, (2013) also find evidence that non-duality pays off through improved reporting quality. They explain their finding by arguing that the shared power allows the independent chairman who is distinct and separate from the CEO to challenge any questionable behaviors of the latter. On the flip side,

García-Meca and Sanchez-Ballesta (2009) find that such prediction is not always true.

The passiveness of board mechanism in enhancing reporting quality is often the situation in environments where ownership is highly concentrated. Put differently, the monitoring role played by corporate boards is usually discounted and less effective where dispersion of ownership is less evident(Shleifer and Vishny, 1997). Strong empirical evidence actually exists that the control role of board is not observable in Latin American context (González and García-Meca, 2014). A study conducted on Korean firms by Min and Verhoeven (2013) also finds that outside directors do not mute the negative impact of controlling shareholders on the firm value. Wang and Yung (2011) find no significant relationship between board independence and earnings management in their Chinese study. Worse, their results show a positively signed

coefficient on the board independence variable suggesting that board independence increases manipulation.

In whatever case, the board is generally considered a crucial player in corporate governance, because it does not only monitor top management (Fama and Jensen, 1983) but also entrenched large owners (Liu and Lu, 2007). In particular, Liu and Lu (2007) document supporting evidence to argument advanced by Shleifer and Vishny (1997) that good corporate governance effectively mitigates the second form of agency conflict. From Tunisian setting, Taktak and Mbarki (2014) also find that affiliated directors who are likely to be less independent and ineffective to monitor are still able to constrain discretionary accruals. Marra et al. (2011) also find evidence that non-executive directors and CEO non-duality assist to constrain earnings management in Italy where closely held firms are many.

In Ghana, Mensah (2012) document that constitution of boards in Ghana is largely under large owner's control. Both Tsamenyi et al (2007) and Agyemang and Castellini (2015) find a supporting evidence. This should lead to absence of the expected quality on corporate boards to curb questionable acts. Aboagye-Otchere et al. (2012) and Ogeh Fiador (2013) confirm this belief by reporting that board independence does not improve financial reporting quality in Ghana. In particular, Aboagye-Otchere et al. (2012) document that board composition has insignificant positive association with disclosure level. In her reporting quality study, Ogeh Fiador (2013) reports that non-executive directors do not significantly improve value relevance of accounting information and also shows that it does not matter to the market if a firm splits the roles of CEO and board chair. However, Bokpin et al. (2011) report that boards with more non-executive members are better at restricting liquidity accumulation than less

independent boards do for their respective firms. This suggests that non-executive directors perform a monitoring role more effectively than inside directors even if they are appointed wholesale by few shareholders. This might imply that non-executive directors should be able to oversee the financial reporting process regardless of how their appointment came through. Thus, there is no clear direction regarding the impact that outside directors and non-CEO chair have on earnings quality. Hence, in line with Ghosh, Marra and Moon (2010), the following bi-directional hypotheses are suggested.

*H3:*

a. *Ceteris paribus, there is an association between the proportion of outside directors and earnings quality*

b. *Ceteris paribus, there is an association between CEO/Chairman separation and earnings quality*

**2.4.4 The interrelationships between IFRS adoption and firm-level governance mechanisms in influencing earnings quality**

It is argued in literature that there could be joint effects of linking certain firm-level incentives to IFRS adoption on earnings quality (Daske et al. 2008 and 2013; Ahmed, Chalmers and Khlif, 2013). Leuz et al. (2003) assert that even though earnings management practices are more prevalent in weak investor protection environments differences in firm-level structures have tendencies to explain the variations in poor earnings quality at the firm level.

From a Chinese context, Liu, Yao, Hu and Liu (2011) support this notion by confirming their prediction that entities audited by the Big 4 firms experience improved accounting quality. This finding is in synchrony with what Bova and Pereira (2012) discover from

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the Kenyan context. They report findings of economic benefits in the inform of improved share turnover by complying with IFRS but the benefits only accruing to firms that have high foreign shareholding because such firms tend to comply more, in line with the reporting incentive hypothesis. Measuring board monitoring by the extent of outsiders on the board and the presence of audit committee, Marra et al. (2011) suggest that the pervasiveness of earnings management does decline for firms with higher board monitoring post-IFRS adoption. They explain their results in this way; that company boards which have higher monitoring features are better able to use IFRS to improve corporate transparency. In a very recent German-based study by Christensen, Lee, Walker and Zheng (2015), findings are documented that improvements in accounting quality measures of earnings management, timely loss recognition and value relevance following IFRS adoption are only evident in firms with higher incentive to adopt the standards. These discoveries suggest that firms with more incentives to reduce the agency costs of information opacity would often exploit the latitudes within the IFRS to provide users with quality financial reports.

Depending on how the ownership and board mechanisms individually relate to earnings quality, a non-directional prediction is made that if IFRS adoption increases earnings quality as expected then the increase should be much more intense for those firms with positively impacting governance features. Hence, the following hypotheses are formulated:

*H4:*

a. *Ceteris paribus, the association between controlling shareholding and earnings quality changes post-IFRS adoption*

*b. Ceteris paribus, the association between proportion of outside directors and earnings quality changes post-IFRS adoption*

*c. Ceteris paribus, the association between CEO/Chairman separation and earnings quality changes post-IFRS adoption*

The conceptual framework which is based on the discussions made throughout the chapter until now is presented in the next section.

## 2.5 Conceptual framework of the study

The study follows Solomon, Solomon, Norton and Joseph (2000) by reducing the synthesis of the institutional framework, theoretical stances and the previous studies reviewed into a conceptual framework by which the study seeks to achieve its objectives. From Figure 2.3 below, it could be observed that an arrow linking two rectangular boxes in which are found controlling shareholding and board mechanisms rightward to another box containing the dependent variable measure, earnings quality. Drawing the basis from the agency theory and monitoring versus expropriation hypothesis, the arrow signifies how the study seeks to explain the earning quality measure, abnormal accruals, by the variables (ownership and board attributes) in the two boxes on the left-hand side. Various variables are controlled for in line with past empirical studies; these include other governance measures such as ownership concentration, board size and other firm-specific characteristics such as size, growth, performance, leverage and audit quality (discussed in chapter three).

Moreover, on the basis of transparency argument it has been extensively argued that a switch from (poor quality) locally set accounting standards to IASB-based accounting standards leads to improvement in the information contained in financial statements

(Barth et al. 2008; Cai et al. 2014). Hence, a direct link between a switch to IFRS and earnings quality is considered in the study.

**Figure 2.3: Conceptual framework of the study**
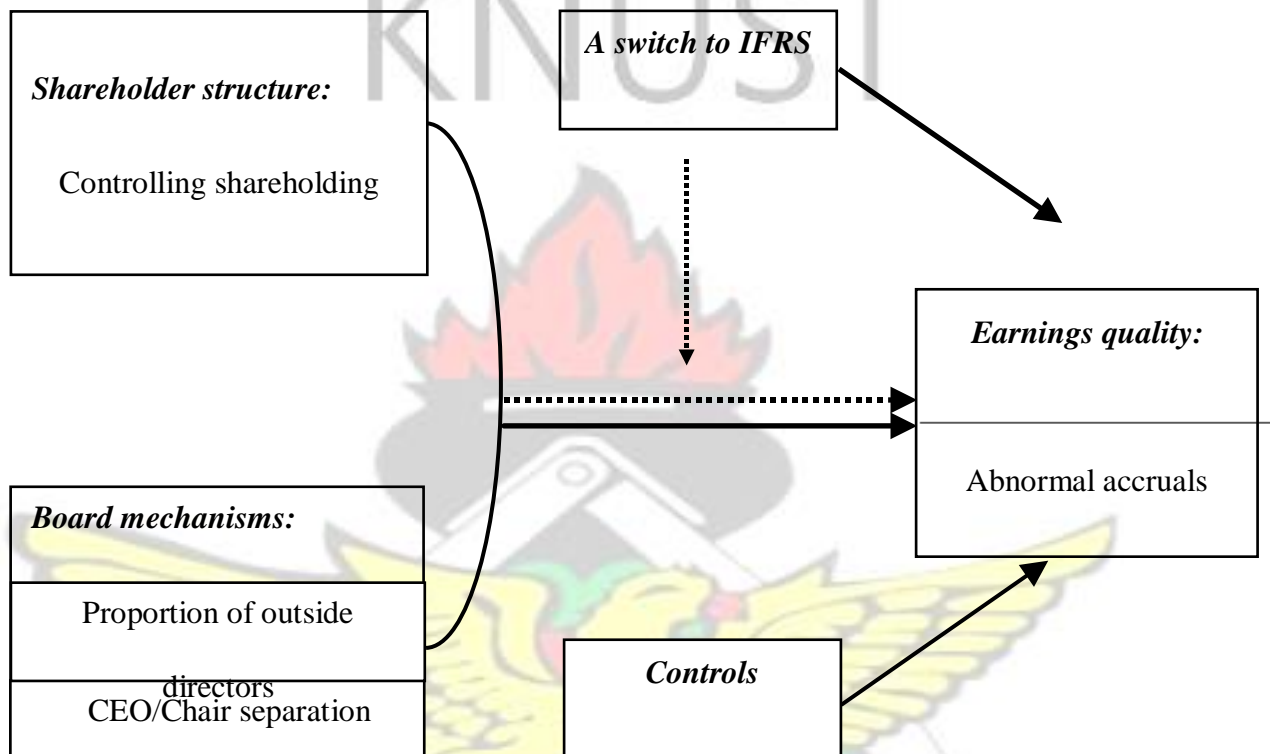


*Source: Author's own work, 2015*

Lastly, using the reporting incentive hypothesis, a dotted vertical line is drawn to connect IFRS to a dotted lateral line to show that the study seeks to explore whether and how the influence of both ownership and board control measures on the quality of reports is affected post-IFRS adoption. In the next section, distinction is drawn between related studies and the current one to reiterate the research gap which this study fills.

**2.6 How does this study differ from previous related works?**

The author considers eleven different works which he deems as very close to the current study. In the Table 2.1 below, distinction is drawn between these related studies and

the present study to present a case in point for the present study. Over here, only the

names of the authors are shown; full titles of the papers are provided in

the references.

**Table 2.1 Summary of similar studies**

| Previous studies | Data and sample | Operationalization of corporate governance | Operationalization of earnings quality | Statistical methodology | Findings | Journal |
|---|---|---|---|---|---|---|
| 1. AboagyeOtchere et al. (2012) | Data on 20 companies listed on the GSE covering a period from 2003-2007 | Board composition, audit committee (AC) composition, board size, AC size, AC competence, block shareholding | Overall disclosure adequacy | Panel data analysis using random effects | Board composition and AC competence have positive relationship with disclosure level but only significant with AC competence. AC composition and block shareholding are insignificantly and negatively related to disclosure level | Journal of Accounting in Emerging Economies |
| 2. Bokpin (2013) | 158 observations from GSE covering a period from 2003-2008 | Audit quality, firm size, performance and leverage | Value relevance of disclosure | Panel data analysis using random effects | Disclosure is not value relevant. Level of disclosure is significantly and positively associated with audit quality, size, age and performance but negatively associated with leverage. | Journal of Applied Accounting Research |
| 3. Ogeh Fiador (2013) | All non-financial firms listed on GSE from 1997 to 2006 | Board composition, CEO duality and board size | Value relevance of accounting earnings and net assets | Panel analysis using random effects | Reports that net assets value per share is value relevant and more so with CEO duality and small board size. Percentage of non-executives does not affect quality and when it does, it does so negatively. | Corporate Governance: The Int'l Journal of Business in Society |
| 4. Ghosh et al (2010) | Firms listed in the Standard and Poor's (S&P) 500, the MidCap 400 and SmallCap 600 covering a period from 1999 to 2006 | Board composition, board size, board structure, AC composition, AC size, AC activity, AC expertise, AC ownership and AC tenure | Absolute value of performanceadjusted discretionary accruals, special items and deferred tax expenses | Univariate analysis, ttests, differences in median, regression analysis | All board and AC measures are associated with earnings management before and after Sarbanes-Oxley Act | Journal of Business Finance and Accounting |

| | | | | | | |
|---|---|---|---|---|---|---|
| 5. Elbannan (2011) | Employs 153 Egyptian firms and 141 Egyptian firms to first and second event analyses | IAS adoption | Earnings management, timely loss recognition and firm valuation (Tobin's Q) | Conducts differencein-differences analysis of accounting and market-related effects of accounting information between pre- and post- | Finds an insignificant reduction in earnings management practices following the revisions of Egyptian local accounting standards to reflect IAS. Also finds significant evidence of market valuation reduction post-accounting standard | Review of Quantitative Finance and Accounting |
| | respectively | | | Accounting standards revision to IAS around two of such revisions in 1997 and in 2006 | revisions. | |
| 6. Siagian and Tresnaningsih (2011) | 80 Indonesian firms on the Jakarta Stock Exchange | Independent directors and independent AC. Controls include debt, firm size, cash flows, issue of shares | Discretionary accruals and earnings response coefficient | Ordinary least square (OLS) regression | Both independent board and AC reduce discretionary accruals and earnings response coefficient | Asian Review Account |
| 7. Liu et al. (2011) | Use 870 quoted Chinese firms with A-shares from 2005 to 2008 resulting in 3,240 firm years | Audit quality and IFRS adoption. Controls include growth, leverage, cash flows from operations, average free float and size in the earnings management models only. | Earnings management and price-based and return-based value relevance of earnings and equity | OLS with industry and year effects control and corrected standard errors | Find that the adoption of IFRS-converged standards in China increased earnings quality. Value relevance increased while income smoothing reduced after the change in standards. The improvement in quality is more pronounced for firms with poor audit quality prior to IFRS adoption | Journal and Accounting, Auditing Finance |

| 8. | Marra et al. (2011) | Use 222 unique non-financial firms listed on the Milan Stock Exchange from 2003 to 2006. The total number of observation of 888 firm years are employed | Independent board and audit committee (AC) presence and IFRS adoption. Controls include majority shareholding, CEO duality, audit quality, size, leverage, return on assets, lagged negative earnings, growth, cash flows from operations, board size and AC financial expertise. | Abnormal working capital accruals (AWCA) and small positive earnings | OLS with industry and time effects and robust standard errors and logit model | Find that IFRS adoption, independent board members and AC individually constrain earnings management and that board monitoring complements IFRS to reduce earnings management the more in Italy | International of Journal Accounting |
|---|---|---|---|---|---|---|---|
| 9. | Bova and Pereira (2012) | Data on 78 Kenyan listed and non-listed firms covering a period from 2005 to 2007 | Ownership structure – foreign shareholding – and IFRS compliance | Share turnover IFRS compliance | Correlation and regression analyses | IFRS compliance is greater in public firms than in private firms. Share turnover improves for foreign shareholding which also is positively associated with IFRS compliance | Journal of International Accounting Research |
| 10. | Goplan and Jayaraman (2012) | 48410 firm years for firms across 22 countries | Insider control. Controls include log of assets, GDP growth, inflation, sales volatility, operating cycle, days payable, capital intensity, sales growth, loss, market to book value, long-term debt, cash flow rights, divergence | Income smoothing and magnitude of accruals | OLS with industry and year effects and standard errors clustered around firm and industry | Higher earnings management in insider controlled firms in weak investor protection environment | The Accounting Review |

| 11. Ismail et al., (2013) | The study uses a Malaysian sample of 4,010 observations over a six-year period | IFRS adoption. Controls include size, leverage, growth and profitability. | Jones-type discretionary earnings management, price-based value relevance of earnings and book value and returnbased | Cross-sectional pooled OLS on all models. Jones models are used for estimating discretionary accruals. | Report increased earnings quality following IFRS adoption in Malaysia | Asian Review of Accounting |

**Note:**

*Studies 1 to 3 relate to Ghana but none of them is concerned with earnings management (abnormal accruals). Again, none of these studies examines the impact of controlling shareholding and accounting standards on earnings quality. Almost all of other studies relate to earnings quality but carried in different settings.*

## 2.7 Chapter summary

The chapter set out the definitions and the scope of key terminologies used in this study. The chapter also discusses the study's institutional framework which covers the development of capital market in Ghana, the concentrated nature of shareholdings among listed firms and the board structure of these firms. Further, four different theoretical underpinnings were discussed including agency theory, monitoring versus expropriation hypothesis, transparency argument and incentives versus standards argument. The chapter then presented the review of prior empirical studies. The chapter showed how the hypotheses mentioned in chapter one are developed. The chapter also outlined the conceptual framework that guides the research design. Finally, the chapter shows how this study differs from previous studies thus, justifying the contribution this study adds to existing literature. The methodology, including the research design, is presented next in chapter three.
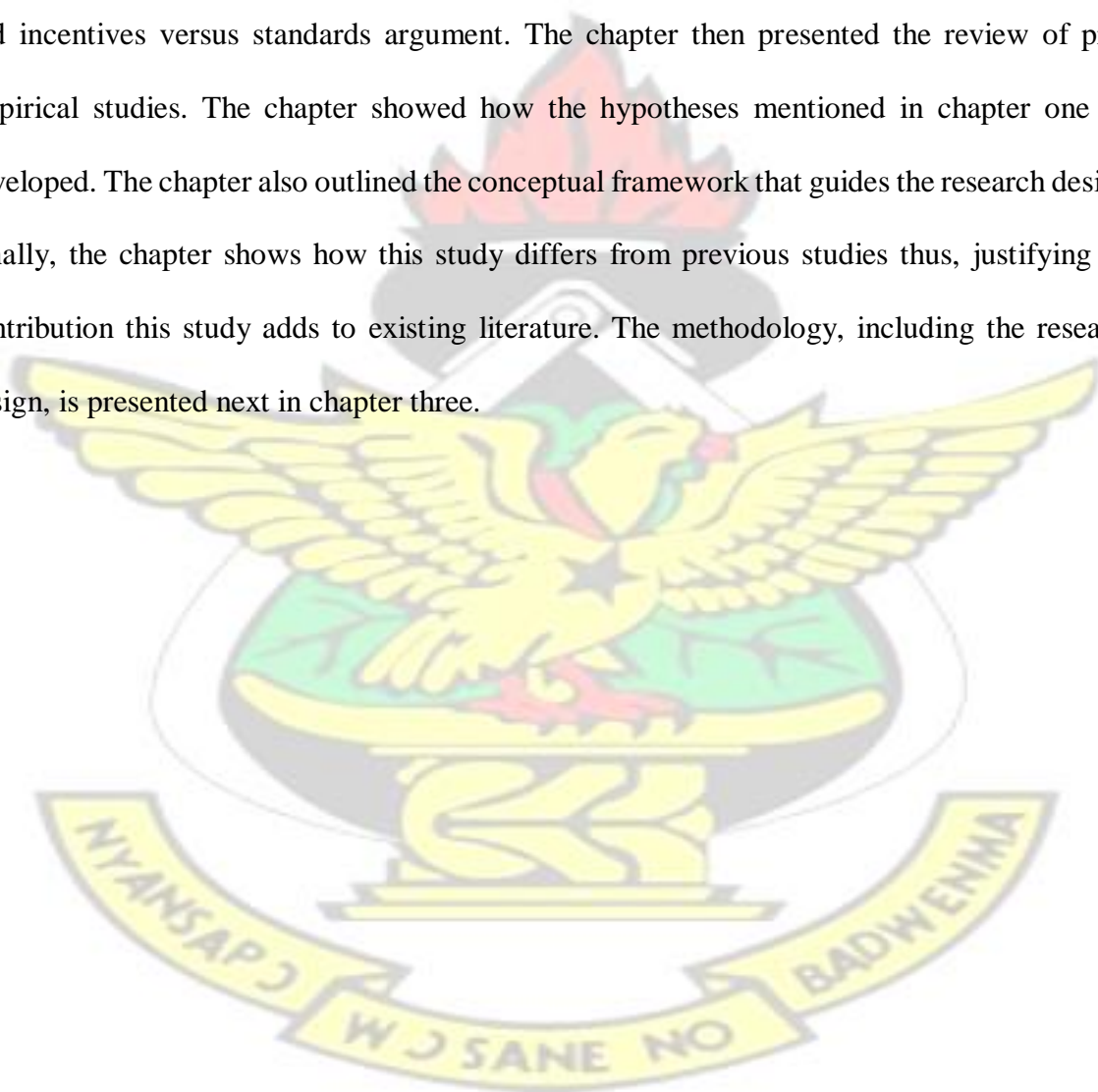
# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.0 Introduction

In this chapter, the author outlines and discusses the step-by-step approach employed to test the four main research hypotheses stated in chapter two. Specifically, the chapter deals with the following:

Section 3.1 begins the chapter with the research design. In this section, the author discusses how the dependent variable is measured and the justification of the measurement choice. The section also details out the explanatory and control variables used and how they are measured in the study. Section 3.2 then sets out the various models and the definitions and expected signs of the variables included in the models. Section 3.3 continues with the details of the data and its collection procedures and how the study arrives at the study sample. Section 3.4 outlines the data analysis procedure. Section 3.5 ends the chapter with a restatement of the research hypotheses going into the main analysis in chapter four.

## 3.1 Research design

The objective of this study is to show how controlling shareholding and outside directorship affect earnings management in the context of accounting changes using listed firms in Ghana. To achieve this, the study uses unbalanced data set collected on firms from 2003 up to 2013 with 2003 dropping due to lagged items. However it is acknowledged that balanced data may yield less noisy results the use of unbalanced data in this study permits higher external validity of the findings as only a few firms list continuously during the study period. Nonetheless, for robustness check the study also uses a balanced dataset. The study sets up test models each of

which contains three different variables including the dependent, explanatory and control variables.

The dependent variable is abnormal accruals (earnings management) while the independent variables include IFRS adoption, controlling ownership and outside directorship. Several control variables are included in the various model to allow for probably solid associations to be established through regressions. The various variables and their measurement are discussed as follows.

### 3.1.1 Measurement of the dependent variable

The study uses accrual-based earnings management as the dependent variable measured using abnormal accruals. Extant literature on earnings management draws distinction between two components of accruals: normal (expected/innate/non-discretionary) and abnormal (unexpected/ unnatural/ discretionary) components. This holds true across several levels of accruals ranging from aggregate accruals to specific accruals such as loan loss provisions, deferred taxes and audit fees (see McNichols, 2001; Philips, Pincus and Rego, 2003). The author chooses to employ the aggregate version of accruals rather than specific ones since this study seeks to understand the impact of IFRS adoption on overall earnings quality. As noted earlier in chapter two, the introduction of IFRS adoption comes to change the treatments of several items rather than isolated ones rendering uneconomical and infeasible to capture abnormal accruals by focusing on specific items. Specifically the study operationalizes earnings quality using an inverse measure, the abnormal working capital accruals as proposed by Defond and Park (2001).

After the work of DeFond and Park, a number of other authors such as Marra et al. (2011) and Prencipe and Bar-Yosef (2011) have also used the AWCA equation in their finite sample

studies. Following Marra et al., (2011) and Prencipe and Bar-Yosef (2011), the AWCA is estimated for each observation individually using the following equation:

$$AWCA_t = WCA_t - [(WCA_{t-1}/Rev_{t-1})*Rev_t] \qquad (1)$$

Where, *AWCA denotes* abnormal working capital accruals; *t and t-1* respectively denoteyears t and t-1; WCArepresents realized non-cash working capital accruals in year *t,* computed as: (Total current assets excluding cash and short-term investments) – (total current liabilities excluding short-term debts and overdrafts); and *Rev*represents theannualrevenue. In line with Marra et al. (2011), AWCA is standardized by year-end total assets to control for heteroskedasticity. Further, in line with Marra et al. (2011) and Prencipe and Bar-Yosef (2011), the absolute value of deflated AWCA is used for the study because no *a priori* assumption is made to predict *ex ante* the direction of the abnormal accruals. Of course, since only working capital accruals are used in establishing the abnormal accruals a key component, the non-current component of firm level aggregate accruals, is ignored. This, to a high extent, is explained and justified by the fact that depreciation manipulations are far easier to attract the adverse attention of a concerned external assessor than stay undetected (DeFond and Jiambalvo, 1994; Park and Shin, 2004; Prencipe and Bar-Yosef, 2011; Marra et al., 2011). Hence, firms are not likely to manage earnings through non-current accruals.

To obtain an alternative measure of abnormal accruals for robustness check, the author slightly changes the construct of AWCA by scaling the absolute value of AWCA by the revenue for the period in line with Prencipe and Bar-Yosef (2011) rather than by the year-end total assets. This is considered appropriate alternative given that the other options including ―undecomposed‖ total accruals (as used in works such as Liu and Lu, 2007 and Prencipe and Bar-Yosef, 2011), Jones type discretionary accruals (as used in works such as Liu and Lu,

2007; Wang and Yung, 2011; González and García-Meca, 2014) and specific accruals (as used in studies such as Chen et al. 2006) are considered inappropriate for reasons such as the finite sample issue and inappropriateness or narrowness of the measure.

### 3.1.2 Explanatory variables

The main explanatory variables used in this study are controlling ownership, outside directors and IFRS adoption.

Following previous studies and in line with the study objectives, concentrated ownership is measured by the presence of controlling shareholder using a dummy variable to separate controlled firms from non-controlled firms within the full sample. As discussed later on, one other measure of ownership concentration is controlled for in all models related to only abnormal accruals models. For instance, Tsamenyi et al. (2007) discover in Ghana's context that concentration is inversely related with the level of annual corporate disclosure. The proxies are explained as follows. Ownership is considered controlling if it directly and/or indirectly holds more than a half of the firm's total voting shares (ordinary shares in this case) outstanding at the year end.

Consistent with previous studies, the following measures of board mechanism are chosen to proxy for board oversight: a) proportion of outside (non-executive) directors on the company board; and b) CEO/chair split (no duality). Many other authors elsewhere including Beasley (1996), Dechow, Sloan and Hutton (1996), Peasnell, Pope and Young (2006), Liu and Lu (2007) and Marra et al. (2011) have found evidence of outside directors providing valid oversight over the financial reporting process. Further, the measures are chosen with due regard to corporate legislations and codes in Ghana and in agreement with some previous

Ghanaian studies such as Abor (2007), Bokpin et al. (2011), and Ogeh Fiador (2013).

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The research also tests for the direct effects of IFRS adoption by incorporating IFRS as an additional explanatory dummy variable in the models. In order to contribute to the incentive versus standards theoretical thinking, IFRS is interacted with controlling shareholders and outside director measures to find out any possible differential impacts of IFRS on the quality of reported earnings of the firms in the abnormal accruals models.

### 3.1.3 Control variables

Other variables than the above which are found to have association with abnormal accruals are appropriately incorporated as controls into the models. The following variables are considered: a) holdings of top one shareholder b) board size; c) growth; d) leverage; e) firm size; f) performance (loss dummy); and g) audit quality.

a) Holdings of the top one shareholder: Consistent with studies such as Ding et al. (2007), Liu and Lu (2007), Tsamenyi et al. (2007), Wang and Yung (2011), Marra et al. (2011) and González and García-Meca (2014), percentage of total ordinary shares outstanding held by the top one shareholder defines ownership concentration in this study. On one hand, higher ownership concentration often leads to obscurity in information due to high incentive to hide the effects of tunneling activities (Liu and Lu, 2007). On another hand, higher concentration induces higher monitoring as the problem of free-riding reduces (Renneboog, 2000). Thus, the impact of concentrated holding remains an empirical issue.

b) Board size: the total board size defined by the total number of directors at the year-end is also controlled for. Addition of board size is in line with Marra et al. (2011) and Ogeh Fiador (2013). Whereas both Dechow et al. (1996), Peasnell, Pope and Young (2005) and Santiago and Brown (2009) find larger boards to monitor less effectively Beasley and

Salterio (2001) and Chin, Kleinman, Lee and Lin (2006) conclude that larger boards have negative association with earnings manipulation. Thus, the impact of board size remains an empirical issue.

c) Growth: Consistent with Peni and Vähämaa (2010), growth is measured by using changes in revenue. Specifically, in line with Marra et al. (2011) growth is measured by deflating the changes in revenues between year t and year t – 1 by revenues in year t – 1. According to McNichols (2001), high growth firms are more likely to use discretionary accruals and have poor quality earnings.

d) Leverage: Consistent with Marra et al. (2011) and Srinidhi, Gul and Tsui (2011), leverage is measured by dividing total liabilities by total assets. It is argued that the more geared a firm is the more prone it is to breaching debt covenants (DeFond and Jiambalvo, 1994). In order to avoid potential losses, firms may adjust earnings often through accruals to mask true state of affairs. On the other hand, highly levered firms are closely monitored by creditors making poor reporting difficult for them. Hence, the impact of leverage remains an empirical issue.

e) Firm size: Firm size is often considered to have a positive association with earnings quality. Usually, larger firms are closely monitored by the market and many other stakeholders making earnings management difficult to carry out (see Park and Shin, 2004; Marra et al. 2011). However, larger firms tend to be more complex in the kinds of transactions they enter into thus, providing them with more opportunity to hide true performance (see Prencipe and Bar-Yosef, 2011). Watts and Zimmerman (1978) also argue that larger firms tend to discount any associated political costs of bigness through under-statement of earnings. Thus, firm size may go any direction. In the main, size is measured by taking the natural logarithm of the total revenue (rather than total assets) in accordance with Ding et

al. (2007) since the introduction of IFRS is more likely to affect total assets than it would total sales given the introduction of many new and improved standards that have bearing on asset items. However, in an additional analysis the natural log of year-end book values of assets is utilized in conformance to Abor (2007) and Marra et al. (2011). Since the association may take any direction, the issue remains empirical.

f)  Audit quality: A dummy variable that takes the value of 1 if a firm has a Big 4 audit firm (Price Waterhouse Coopers, KPMG, Ernst & Young and Deloitte & Touche) and 0 otherwise (see Bokpin, 2013). The use of a big audit firm has been found to constrains earnings management and improve earnings quality (Dechow et al. 1996; Prencipe and Bar-Yosef, 2011; Marra et al. 2011) because managing earnings via accruals often attracts auditors' attention.

g)  Lagged loss year: In line with Marra et al. (2011), a loss dummy in included to control performance. It is coded as 1 if a firm reports earnings below zero in the previous year and 0 otherwise. Firms with lagged negative net income usually have higher incentive to report managed earnings to reverse or avoid poor trend (Siregar and Utama, 2008).

## 3.2 Main regression models and variables definitions

The section presents the models used to carry out the multivariate analysis. Consistent with many other studies (see Marra et al., 2011; Bokpin et al., 2013; Ogeh Fiador, 2013), this study uses static rather than dynamic panel models. The use of static models is often appropriate if the researcher expects the possibility of reverse causality to be remote (Greene, 2003; Gujarati, 2003). Given that the move to IFRS from GNAS was mandatory (AssensoOkofo et al., 2011) and the fact many governance variables relating to the ownership and board structures are sticky and almost unchanging over the study period (e.g. Tsamenyi et al., 2007; Agyemang and Castellini, 2013), the issue of simultaneity is less problematic. The static models used show

how the study tests the associations of IFRS adoption, controlling shareholding and outside directorship with earnings management measured by the level of absolute value of abnormal working capital accruals deflated by total assets.

First, Model 1 is developed using the following equations to test for the ―direct‖ effects of IFRS adoption, controlling shareholding and two outside directorship measures (the proportion of outside directors and CEO/Board chair separation) on abnormal accruals. Thus, Model 1 tests Hypotheses 1 to 3.

$$ABS\_AWCA_{it} = a_0 + a_1IFRS_{it} + a_2CONTR_{it} + a_3OUTDIR\_PROP_{it} + a_4NO\_DUAL_{it} +$$
$$a_5TOP1_{it} + a_6BSIZE_{it} + a_7S\_GROWTH_{it} + a_8LEV_{it} + a_9LOG\_REV_{it} +$$
$$a_{10}LAG1\_LOSS_{it} + a_{11}A\_QUA_{it} + \varepsilon_{it} \quad (2)$$

$$ABS\_AWCA_{it} = a_0 + a_1IFRS_{it} + a_2CONTR_{it} + a_3OUTDIR\_DOM_{it} + a_4NO\_DUAL_{it} + a_5TOP1_{it}$$
$$+ a_6BSIZE_{it} + a_7S\_GROWTH_{it} + a_8LEV_{it} + a_9LOG\_REV_{it} + a_{10}LAG1\_LOSS_{it}$$
$$+ a_{11}A\_QUA_{it} + \varepsilon_{it} \quad (3)$$

Model 1 is split into ―a‖ and ―b‖. Equation 2 above is considered the Model 1a while Equation 3 is taken as Model 1b. All the variables are the same however, in **Model 1a** the outside director representation is measured by using a continuous variable which is symbolized by *OUTDIR_PROP* and defined by the proportion of outside directors of the total board size. **Model 1b** measures outside director proportion by a dichotomous variable symbolized by *OUTDIR_DOM* and given a value of 1 if the board is outside dominated and 0 if the board is inside dominated. Outside dominated board is construed if the proportion of outside directors is within the upper 50th percentile proportion (above the median proportion as cut-off point) and inside dominated board if otherwise. The use of the dichotomous measure allows the study to find out whether higher outside director representation group affects earnings quality

differently from lower group. Dichotomization in this respect is not inconsistent with literature. For instance, González and García-Meca (2014) measure board independence using both continuous variable, defined by the proportion of independent directors, and dummy variable defined by whether the proportion exceeds 50% cut-off. Ding et al. (2007) also employ several percentage cut-offs to define state ownership. Religiously following González and García-Meca (2014), which is very close to the present approach, is not possible in this study given that almost all of the studied firms have more outside directors than executive directors.

Second, the **Model 2** is developed using Equation 4 below. Equation 4 is an expansion of Equation 3 as it modifies the latter by adding three ―interaction terms‖ between IFRS dummy and a) controlling shareholding; b) representation of outside board members; and c) CEO non-duality. In line with Marra et al. (2011), Rajan and Zingales (1998) and Balli and Srensen(2013), the interaction terms are used to capture the incremental effects on abnormal working capital accruals of the three variables after IFRS adoption as a way of testing for Hypothesis 4 in chapter one.

$$ABS\_AWCA_{it} = \measuredangle_0 + \measuredangle_1 IFRS_{it} + \measuredangle_2 CONTR_{it} + \measuredangle_3 OUTDIR\_DOM_{it} + \measuredangle_4 NO\_DUAL_{it} +$$

$$\measuredangle_5 IFRS_{it}*CONTR_{it} + \measuredangle_6 IFRS_{it}*OUTDIR\_DOM_{it} + \measuredangle_7 IFRS_{it}*NO\_DUAL_{it}$$

$$+\measuredangle_8 TOP1_{it} + \measuredangle_9 BSIZE_{it} + \measuredangle_{10} S\_GROWTH_{it} + \measuredangle_{11} LEV_{it} + \measuredangle_{12} LOG\_REV_{it} +$$

$$\measuredangle_{13} LAG1\_LOSS_{it} + \measuredangle_{14} A\_QUA_{it} + \varepsilon_{it} \qquad\qquad (4)$$

Definition of the variables and their expected signs are as follows:

| Variables | Definitions | Expected Signs |
|---|---|---|
| ABS_AWCA | Refers to absolute value of abnormal working capital accruals | |
| IFRS | A dummy variable that takes the value of 1 if a firm reports under IFRS and 0 otherwise (Marra et al., 2011; Daske et al., 2013). | − |
| CONTR | A dummy variable that takes the value of 1 if there is a controlling shareholding defined by an owner holding directly and/or indirectly more than 50% of firm's ordinary shares and 0 otherwise | +/− |
| OUTDIR_PROP | A continuous variable measured by the proportion of outside directors represented on company board at the yearend (Abor, 2007) | +/− |
| OUTDIR_DOM | A dichotomous variable which measures outside dominated board. It considers the board as outside dominated and takes a value of 1 if the proportion of outside directors exceeds $50^{th}$ percentile proportion cut-off and as inside dominated if otherwise which takes a value of 0. | +/− |
| NODUAL | A dummy variable that takes the value of 1 if the firm's CEO does not double as the chairperson of the board at the year end and 0 otherwise (Prencipe and Bar-Yosef, 2011) | +/− |
| IFRS*CONTR | Interaction term between post-IFRS and presence of controlling shareholder | +/− |
| IFRS* OUTDIR_DOM | An interaction term between post-IFRS and outside dominated board | +/− |
| IFRS*NODUAL | An interaction term between post-IFRS and absence of CEO duality | +/− |
| TOP1 | A continuous variable defined as the percentage of equity shares held by the top one shareholder | +/− |
| BSIZE | A continuous variable defined as the total number of board members | +/− |
| S_GROWTH | A continuous variable defined as the change in sales from year *t-1* to *year* t over sales in year *t-1* | + |
| LEV | A continuous variable defined as total liabilities over total assets | +/− |
| LOG_REV | A continuous variable defined as natural logarithm of total revenue | +/− |
| LAG1_LOSS | A dummy variable that takes a value of 1 if a firm reports loss one year before and 0 otherwise | + |
| A_QUA | A dummy variable that takes a value of 1 if a firm is audited by a Big 4 auditing firm and 0 otherwise | − |

### 3.3 Data collection and sample selection

The study relies solely on secondary data obtained from the annual reports of all nonfinancial companies listed on the GSE from 2003 to 2013. The data collected from the company annual reports are supplemented by those from 2006 and 2010 GSE Fact Books. The annual reports are obtained from both the GSE floor-and-brick library in Accra and Annual Reports Ghana. The Fact Books are available on sale at the GSE Library. The data collected cover the financial statements items, shareholding and corporate governance characteristics required for measuring all the three variables. Due to lagged measures taken for some variables, 2003 is lost in the analysis. Moreover, data relating to the earliest period of a firm that gained listing status after 2003 is still lost due to lags taken of those observations. For example, if a firm listed on the exchange in say 2007 then its first financial data (relating to 2007) would be lost.

The full final sample used for the study is 187 firm years relating to 21 non-financial listed firms. The procedure followed to arrive at the final sample is provided in Table 3.2 below. Appendix 12 details out the selection procedure year-on-year and shows the names of firms employed in the study. The initial sample consists of 390 firm year observations for companies that traded on the GSE during the 10 year study period. First, 22 observations are dropped because these relate to firms yet to gain listing status.

**Table 3.2 Sample selection**

|                                             | Pooled observations |
| ------------------------------------------- | ------------------- |
| Possible initial sample                     | 390                 |
| *Less:*                                      |                     |
| Observations related to firms not yet listed | (22)                |

| | |
|---|---|
| Observations related to firms in the financial and insurance sectors | (102) |
| Observations related to firms in the mining and oil sectors | (20) |
| Observations related to firms delisted | (4) |
| Missing data | (55) |
| **Total** | **187** |

Eleven (11) financial and insurance listed companies with total firm year observations of 102 are also deleted because these firms are usually subject to stricter regulations which may provide different incentives to manipulate or not manipulate accounting earnings (see Peasnell, Pope and Young, 2000; Rusmin, 2010; Marra et al., 2011; Ismail et al., 2013). Moreover, for the same reason as that used to eliminate the financial and insurance firms and the fact that their financial data are stated in foreign currencies, 3 firms in the mining and oil sectors with total observations of 20 are also deleted, thus, bringing down the initial observations to 246 (i.e. 390 – 22 – 102 –20). Further 4 and 55 observations respectively relating to the specific year in which 4 different firms became delisted and to missing data are also deleted. Hence, the final sample drops down to 187 (i.e. 246 – 4 – 55) observations. The author next outlines the steps used to analyze the data.

### 3.4 Data analysis procedures

This section deals with the procedures adopted to analyze the collected data in an attempt to fulfill the study objectives. Broadly, the study follows three stages in this respect as discussed in the following paragraphs.

First, the descriptive analysis of the data is carried out to understand how data are generally and statistically distributed. In this regard, summary statistics such as means, medians,

standard deviations, minimum values and maximum values are computed for both full and various sub-samples. Next to the descriptive analysis is the univariate analysis of ABS_AWCA. This involves tests of differences in means using t-test across various ownership structure based sub-samples and reporting regimes, tests of differences in medians using Mann-Whitney two-sample across various ownership structure based sub-samples and reporting regimes. The study also produces bivariate or pairwise correlation matrix for all other dependent, independent and control variables. Finally, multivariate analysis is performed to obtain more robust associations of the explanatory variables with abnormal accruals after incorporating various controls which span profitability, ownership concentration, board size, growth, leverage, firm size, performance and audit quality into the test models. To decide on the appropriate estimator, the following procedures are followed.

**Model specification procedure**

The data used take a panel form. According to Yaffee (2003), who presents a paper titled ―A Primer for Panel Data Analysis‖, specifying models for panel dataset is analogous to prescribing drugs that are appropriate given a particular ailment diagnosed. In particular, he argues that models have to be specified by taking into account the problems that afflict each particular model. For instance, for the pooled ordinary least squares (OLS) estimation to become safely usable there should necessarily be validation of or support for at least the presence of residual normality, error term independence and residual homogeneity. Yaffee (2003) reveals that diverse analytical models exist for panel data but broadly groups them into three categories to include the pooled OLS models, random effects (RE) models and fixed effects (FE) models. Clark and Linzer (2015) indicate that even though there is necessary trade-off between obtaining results with high variance and those with bias when deciding between RE and FE estimators, they submit that in all situations both are more

preferable than the pooled OLS model. The pooled OLS is a cross-sectional approach that disregards the panel form of data and operates under very strict assumptions while both RE and FE estimations exploit the richness embedded in panel dataset to compute the regression coefficients (Baltagi, 2005). According to Baltagi (2005), a panel data approach brings larger samples, more information and richer data that reflect the effects of time and market dynamics.

Deciding on the specific estimation is far less than clear. The RE estimation relies on the strong assumption that the unobserved firm effects component (of the error term) are uncorrelated with all the explanatory variables while the FE estimation allows for unspecified forms of covariance (Clark and Linzer, 2015). In order to determine the presence of unobserved firm effects (unobserved heterogeneity), the study uses BreuschPagan (1980) Lagrange Multiplier (LM) tests of random effects using the OLS estimation as the base. The OLS estimation becomes inappropriate if unobserved heterogeneity is detected. When the pooled OLS approach is used for panel dataset, the variance matrix, based on independent and identically distributed errors may not be adequate since the error terms for a given firm are likely to be correlated over time.

The suitability of the FE estimation is also tested against poolability of data. To do this, the Hausman-based test is performed to decide between the FE and OLS estimations. With the results of the previous two tests in mind, the study follows on with Hausman's (1978) tests to differentiate between the RE and the FE estimations. Under the null hypothesis of the test both estimators are consistent but the RE is more efficient (Clark and Linzer, 2015). The alternative hypothesis considers the RE estimator inconsistent. A large test statistic (small probability value) rejects the null for conventional confidence level of 95%. Moreover, Clark and Linzer (2015) suggest that in dealing with few observations (fewer than 200 as

stated in page 404 of their paper), RE estimator performs better even when the primary assumption of nil correlation between independent variables and the unit (firm) effects under the RE estimator is strongly violated. The results of all these tests are presented in chapter four.

In panel data analysis, the problem of heteroskedasticity should be expected (Long and Ervin, 2000). This issue happens when the variance of the error does not remain unvaried across observations. In the presence of heteroskedasticity, the estimations of homoscedasticity assumed model, the pooled OLS, still remain unbiased but inefficient. Such estimations deflate standard errors leading to enhanced test values (reduced p-values) which, in turn, cause the study to fail to refuse to reject the null hypothesis. Thus, in this situation, estimation with heteroskedasticity corrected standard errors becomes preferable to that made with conventional standard errors since the former is likely to yield more valid p-values of the coefficients. The study tests for the null hypothesis of constant variance across observations using both normal distribution assumed BreuschPagan/Cook-Weisberg test (employing a Stata 13.1 command, estat hettest). The study also shows the fitted values against the residuals of the pooled OLS estimations of the models using distribution plots. Aside model specification and heteroskedasticity tests, other diagnosis tests are performed including checks for residual normality, checks for multicollinearity between predictor variables, checks for serial correlation (autocorrelation) and checks for fixed effects of time and industry. As a way of checking for robustness of results and addressing any possible endogeneity that is often prevalent in many corporate governance studies (Brown et al. 2011), the study further reports results for FE estimation of the three models. The hypotheses are restated in the next section.

## 3.5 Restating hypotheses

From the research design, the hypotheses in Chapter 1 are restated, extended and made more specific in their alternative form as below:

1. Ceteris paribus, there is negative association between IFRS adoption and abnormal accruals.

2. Ceteris paribus, there is an association between controlling shareholding and abnormal accruals.

3. Ceteris paribus, there is an association between outside directors and abnormal accruals. This is broken down into two parts:

    a. Ceteris paribus, there is a relationship between proportion of outside directors and abnormal accruals

    b. Ceteris paribus, there is a relationship between CEO non-duality and abnormal accruals

4. Ceteris paribus, the association of controlling shareholding, proportion of outside directors and CEO non-duality with abnormal accruals changes post-IFRS adoption

    a. Ceteris paribus, the association between controlling shareholding and abnormal accruals changes after IFRS adoption

    b. Ceteris paribus, the association between outside dominated board and abnormal accruals changes after IFRS adoption

    c. Ceteris paribus, the association between CEO/chair separation and abnormal accruals changes after IFRS adoption

## 3.6 Chapter summary

Chapter three has discussed the research methodology used in the study. In particular, the philosophical orientation, the design of the research, study periods, variables used and their measures, sample and its selection procedure and analytical procedures are fully discussed. The chapter clearly explains why the positive accounting theory is picked for the study. The various variables employed in the study along with the reasons for the choices are fully discussed in the chapter. Twenty one non-financial firms listed on the GSE over the period: 2004 – 2013 are used for the study. The chapter also outline the analytical procedure adopted and concludes by restating the original hypotheses. Chapter 4 is next.
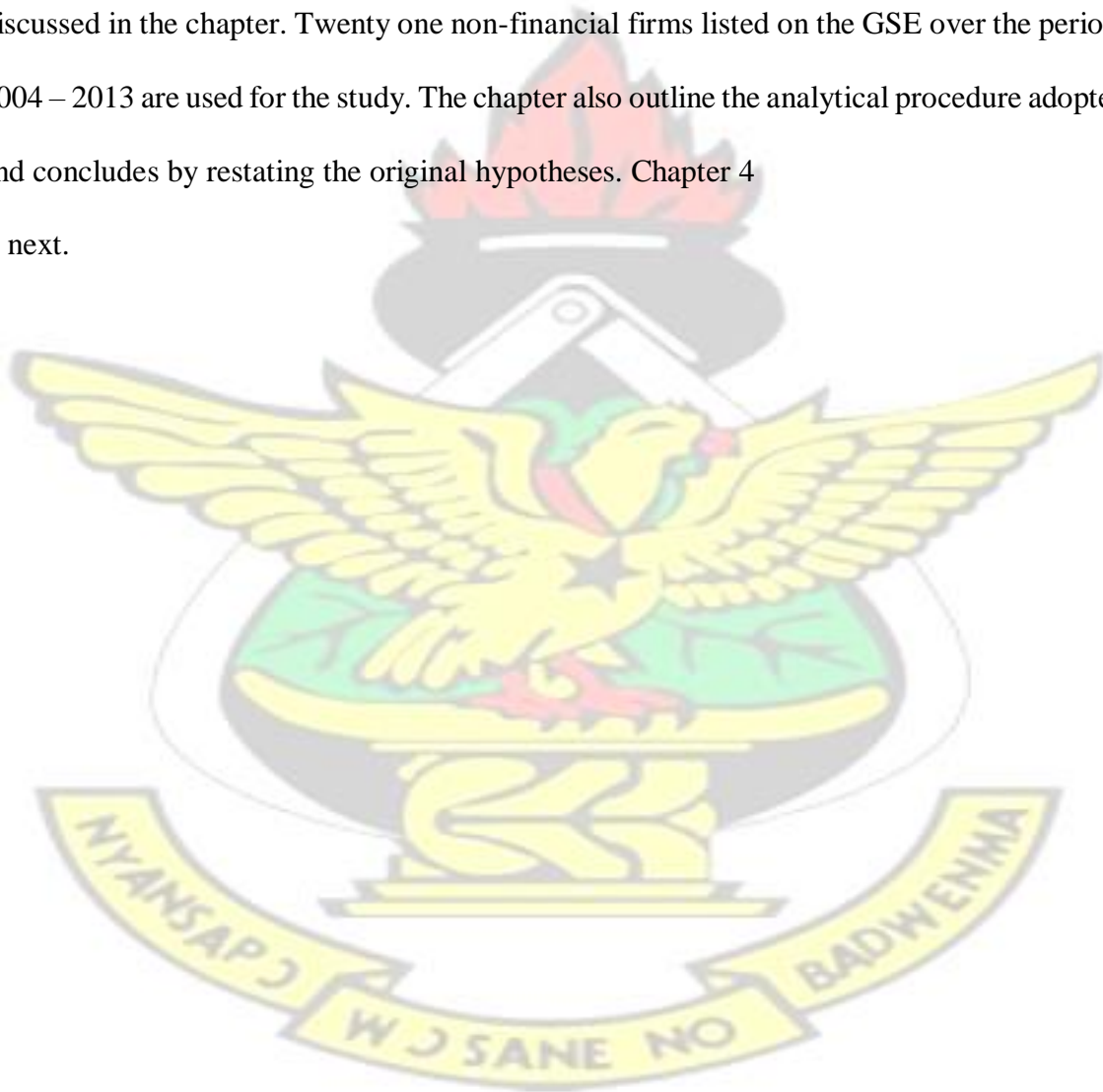
# CHAPTER FOUR

# DATA PRESENTATION, ANALYSIS AND DISCUSSION

## 4.0 Introduction

This chapter presents the results of the data analysis and how the results are discussed. Particularly, in the chapter, the author presents and discusses the descriptive statistics, correlation analysis, regression diagnostics and results of the regression analyses. As a reminder, the study primarily uses a panel data-based analysis, specifically the RE estimations but along with pooled OLS regression in the multivariate analysis. For robustness check, the chapter also presents results of FE estimations. STATA 13.1 software is used to run all the results presented in this chapter.

The chapter starts with Section 4.1 which presents the descriptive statistics. Section 4.2 continues with the univariate analysis of the dependent variable. After that, Section 4.3 reports the results of the correlation (bivariate) analysis. Next, Section 4.4 reports the results of the multivariate analysis of the three models (Model 1a, Model 1b and Model 2). The section first presents the outcome of various data and regression diagnostics carried out before obtaining the final estimations before it reports the results for the models. Section 4.5 follows with additional analyses conducted to check for the sensitivity of the results of the multivariate analysis presented in Section 4.4 and also gain broader insight into the main concerns of the topic. Section 4.5 concludes with a tabular summary of results. Section 4.6 is dedicated to the discussion of the main findings. Section 4.7 concludes with other discussion which focuses on the results obtained for the primary controls.

## 4.1 Descriptive statistics

This section shows the results of the descriptive analysis of the variables used in the study. The results are presented in Table 4.1 below. The table provides summary statistics that describe the main abnormal accrual measure, the abnormal working capital accruals, the various explanatory various spanning board and ownership characteristics of interest, and the primary control variables incorporated into the three main models.

**Table 4.1 Descriptive statistics Panel A: Pre- and Post-IFRS samples**

|  | Pre-IFRS (04 – 07/08) = 63 firm years | | Post-IFRS (07/08 -13) = 124 firm years | |  |
|---|---|---|---|---|---|
|  | **Mean** | **Std. Dev.** | **Mean** | **Std. Dev.** | **Mean or Prop diff.** |
| *Continuous variables* |  |  |  |  |  |
| OUTDIR_PROP | 0.81 | 0.11 | 0.79 | 0.13 | -0.01 (0.650) |
| TOP1 | 0.49 | 0.21 | 0.52 | 0.23 | 0.03 (0.855) |
| BSIZE | 8.24 | 1.66 | 7.67 | 2.03 | -0.57 (1.919)* |
| S_GROWTH | 0.32 | 1.21 | 0.23 | 0.56 | -0.08 (-0.63) |
| LEV | 0.49 | 0.23 | 0.60 | 0.36 | 0.11 (2.284)** |
| LOG_REV | 16.37 | 1.93 | 17.17 | 2.10 | 0.80(2.531)** |
|  |  |  |  |  |  |
| *Dichotomous Variables* |  |  |  |  |  |
| CONTR | 0.56 | 0.50 | 0.57 | 0.50 | 0.02 (0.222) |
| OUTDIR_DOM | 0.37 | 0.49 | 0.23 | 0.42 | -0.14 (-2.02)** |
| NODUAL | 0.75 | 0.44 | 0.87 | 0.34 | 0.12 (2.144)** |
| A_QUA | 0.62 | 0.49 | 0.77 | 0.43 | 0.15 (2.110)** |
| LAG1_LOSS | 0.14 | 0.35 | 0.28 | 0.45 | 0.14 (2.12)** |

*Note: t-statistic is reported in parenthesis; *, ** and *** indicate significance at p<0.10, p<0.05 and p<0.01 respectively. T-test is used to test for the differences in means for the continuous measures while a Stata command, prtest, is applied on the dichotomous measures to test for differences in proportions.*

**Panel B: Full Sample – 187 firm years**

|  | Mean | 25th Per. | 50th Per. | 75th Per. | Std. Dev. | Min | Max |
|---|---|---|---|---|---|---|---|
| ABS_AWCA | 0.12 | 0.04 | 0.08 | 0.15 | 0.13 | 0.00 | 0.97 |
| CONTR | 0.57 | 0.00 | 1.00 | 1.00 | 0.50 | 0.00 | 1.00 |
| OUTDIR_PROP | 0.80 | 0.75 | 0.86 | 0.88 | 0.12 | 0.33 | 0.92 |
| OUTDIR_DOM | 0.27 | 0.00 | 0.00 | 1.00 | 0.45 | 0.00 | 1.00 |
| NODUAL | 0.83 | 1.00 | 1.00 | 1.00 | 0.38 | 0.00 | 1.00 |
| TOP1 | 0.51 | 0.31 | 0.50 | 0.70 | 0.22 | 0.11 | 0.94 |
| BSIZE | 7.86 | 7.00 | 7.00 | 9.00 | 1.93 | 3.00 | 12.00 |
| S_GROWTH | 0.26 | 0.01 | 0.18 | 0.30 | 0.83 | -0.84 | 9.48 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| LEV | 0.57 | 0.38 | 0.54 | 0.76 | 0.32 | 0.04 | 2.46 |
| LOG_REV | 16.90 | 14.95 | 17.16 | 18.43 | 2.07 | 12.07 | 21.01 |
| A_QUA | 0.72 | 0.00 | 1.00 | 1.00 | 0.45 | 0.00 | 1.00 |
| LAG1_LOSS | 0.24 | 0.00 | 0.00 | 0.00 | 0.43 | 0.00 | 1.00 |

The table consists of two panels: panel A and panel B. Panel A presents the summary statistics (mean and standard deviations) of only independent and control variables for pre- and post-IFRS sub-samples and shows the differences in means. Panel B shows expanded summary statistics including the mean, 25th percentile, median, 75th percentile, minimum value, maximum value and standard deviation of all variables for the pooled sample.

From Panel A, it is apparently clear that proportion of outside directors and the extent of controlling shareholder existence do not vary much between the two periods. However, the proportion of outside dominated boards is significantly lower in the adoption period than in the pre-adoption period. This may suggest that the enforcement of the new code issued in 2010 by the SEC of Ghana is weak given that the new provisions call for firms to appoint more outsiders. Many more firms are characterized by separation of the roles of CEO and board chairperson after IFRS adoption compared to before the change. This may not be naturally driven as the new code strongly recommends that firms should split the roles. The proportion of firms with controlling shareholders seeing no discernible variation after IFRS introduction presents a very useful econometric benefit because if it is found out that both controlling shareholders and IFRS influence earnings quality to some extent one cannot easily isolate IFRS influence (Marra et al. 2011). The use of quality auditors also rises significantly after IFRS adoption and this could be due to the need to engage more IFRS inclined auditors to audit the books. Moreover, it is not surprising given that the task force which proposed the IFRS adoption was mainly composed of employees of these audit firms (GNA *Business and Economics*, 2006) and possibly their firms might have bought ways through. The lower sales growth rate post-IFRS may be due to more stringent requirements

dictated by IAS 18: *Revenue Recognition* that a firm has to meet before recognizing revenue. More losses in the post-IFRS period might offer evidence of introduction of higher conservatism which has been shared and argued as a feature of the principled-based IFRS (see Ismail et al. 2013).

It can be observed from Panel B that the level of absolute value of abnormal working capital accruals scaled by assets averages 0.12 (median of 0.15) with a standard deviation of around 0.1274 suggesting high variability in the dependent variable measure across observations and non-normal distribution (skewness) of the measure. The study does not transform the identity measurement of the dependent variable because the non-normality, if so serious, should water down to significantly affect residual normality, but which it does not in this study. The average ABS_AWCA for the Ghanaian non-financial listed firms does not compare favourably with what Marra et al. (2011) report for similar firms in Italy. They report average ABS_AWCA of around 0.08 suggesting that earnings management is likely to be higher in Ghana than in Italy.

Consistent with previous Ghanaian studies including Abor (2007) and Ogeh Fiador (2013) and in line with standards of the corporate world across the globe, the summary statistics show that the extent to which external directors are represented on the boards of quoted non-financial firms on the GSE is high. Specifically, about 80% of the total board members of the sampled firms are all outside directors. After partitioning the total observations into two groups of firms with outside dominated board and those without, the statistics suggest that around 27% of the 187 observations have board highly dominated by non-executives. Moreover, only about 17 out of every 100 firm years observed concentrate the powers and the functions of the CEO and the board chairperson in one hand suggesting low level of duality among the studied firms. The statistics for the ownership dynamics of interest in this

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study confirm the findings of Tsamenyi et al. (2007), Greif (2012) and Agyemang and Castellini (2015) that there is high level of ownership concentration among

Ghanaian firms. Panel A shows that for more than 50% of the total number of firm year observations, there is a shareholder who controls, directly and/or indirectly, more than 50% of the equity shares outstanding.

The seven control variables including holdings of top one shareholder, board size, sales (revenue) growth, leverage, natural log of sales (revenue), audit quality and one year lagged loss are also described. The mean (median) score of the holdings of the top one shareholder is 51% (50%) with a standard deviation of 22% indicating a normal distribution across different cases. This confirms to a large extent the belief and other previous findings that ownership is concentrated among Ghanaian companies. The growth level has averaged 26.0% over the ten years across firms with the minimum and the maximum reaching - 84.34% and 948% respectively. The high growth rate may be suggestive of general price level increases and improved performance over the period rather than by the requirements of the new standards. Not surprising, the variance growth rate is so distant from the mean growth rate. Reliance on debt finance is obviously on the higher side and the distribution of leverage ratios is likely to be normal given the smaller than mean standard deviation and closeness of median to mean percentage. A mean leverage of 57% compares nearly to the findings of Abor (2007) who reports mean capital structure ratio of around 58% but inconsistent with Bokpin (2013) who reports average financial leverage of over 90%. The latter may be due to the inclusion of financial institutions in his study sample because financial institutions often do have high level of liabilities in the form of deposits (Taktak and Mbarki, 2014). Quite a number of firms report negative equity values as the maximum leverage score far exceeds 200% suggesting that total liabilities run as more than twice as

the total assets. In line with findings obtained by Bokpin (2013), the study reports that about

72% of the non-financial firms receive

assurance services from one of the Big Four audit firms including

PricewaterhouseCoopers (PWC), Ernst and Young (EY), Deloitte and Touche and KPMG.

Finally, starting from 2003 and ending in 2013 the firms have reported net losses up to about

24% of all net incomes declared over the period. Subsequent to loss making periods, firms

are typically pushed to polish up their accounts in order to stop any poor performance trend.

The next section presents the results of the univariate analysis of the dependent variable.

## 4.2 Univariate analysis

This section presents the results of univariate analysis. More specifically, the author reports

results obtained for two-sample equality t – test and Wilcoxon Rank-sum test of the

dependent variable, ABS_AWCA, in respect of four different groups: pre- versus postIFRS

firms, controlled firms versus non-controlled firms, inside dominated board versus outside

dominated board firms, and duality versus non-duality firms. Table 4.2 reports the results.

From Panel A of Table 4.2, it can be observed that the absolute value of abnormal working

capital accruals, lagged by total assets, is significantly lower in the post-adoption period

than in the pre-adoption period (but only mean is different at 1% significance level)

indicating that IFRS adoption improves earnings quality. There is however no significant

difference in median values between pre- and post-IFRS.

Thus, preliminary partial support is obtained for Hypothesis 1. Panel B of Table 4.2 shows

that there is no significant variation in the absolute value of abnormal working capital

accruals, lagged by total assets, between firms with controlling shareholding and those

without  (both mean and median are not statistically different) indicating that controlling

shareholding does not reduce or increase earnings management. This initially rejects the second proposition.

**Table 4.2 Univariate analysis using T-test and Wilcoxon Rank-sum test**

Panel A

| | Pre-IFRS | | | Rank-sum test | Post-IFRS | | | Test of differences in means and medians | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | Median | Std. Dev. | | Mean | Median | Std. Dev. | T-test | Wilcoxon |
| ABS_AWCA | 0.14812 | 0.09000 | 0.17156 | | 0.10044 | 0.07000 | 0.09445 | -0.04768 | -0.02000 |
| (-2.45200)** | (- | | | 1.38900) | | | | | |

Panel B

| | Non-controlled firms | | | Controlled firms | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | Median | Std. Dev | Mean | Median | Std. Dev. | | | |
| ABS_AWCA | 0.12371 | 0.09000 | 0.12963 | 0.11100 | 0.08000 | 0.12476 | | -0.01271 | 0.02000 |
| | | | | | | | | (-0.67540) | (-0.91100) |

Panel C

| | Insider dominated board | | | Outsider dominated board | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | Median | Std. Dev. | Mean | Median | Std. Dev. | | | |
| ABS_AWCA | 0.10112 | 0.08000 | 0.10274 | 0.15753 | 0.10000 | 0.17168 | | 0.05642 | 0.02000 |
| | | | | | | | | (2.74500)*** | (2.00800)** |

Panel D

| | **Duality firms** | | | | **No duality firms** | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | Median | Std. Dev. | | Mean | Median | Std. Dev. | | |
| ABS_AWCA | 0.11701 | 0.10000 | 0.10687 | | 0.11640 | 0.08000 | 0.13150 | | 0.00061 (0.02460) | 0.02000 (0.47000) |

*Note: t-statistic is reported in parenthesis; *, ** and *** indicate significance at p<0.10, p<0.05 and p<0.01 respectively*

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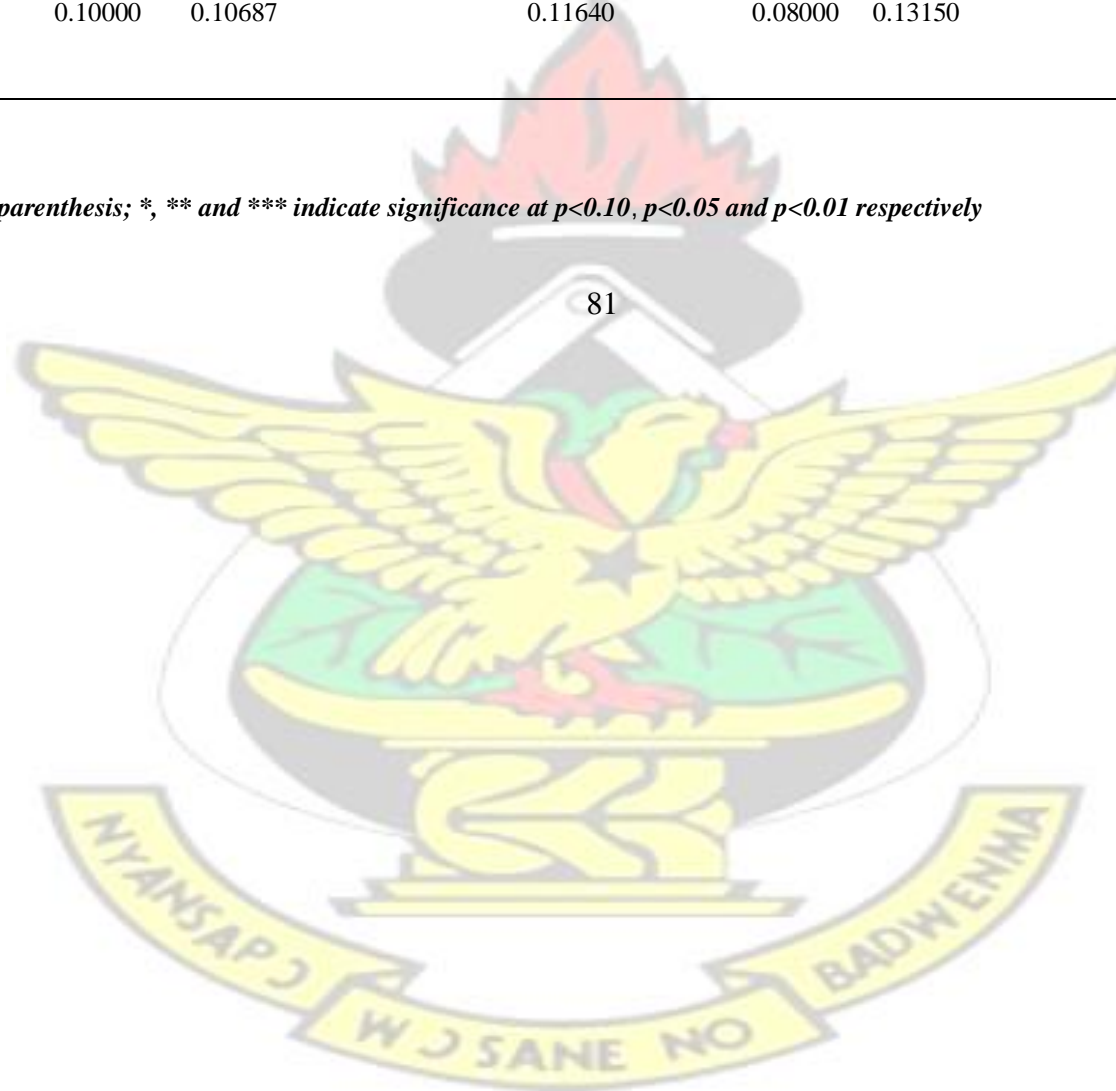
Panel C of Table 4.2 presents the descriptive statistics of the test in respect of board composition. It shows that absolute value of abnormal working capital accruals, scaled by total assets, is significantly higher for firms that have board dominated by outside (both mean and median are different at 1% and 5% respectively) suggesting that the use of more outside directors leads to increased earnings management. This lends preliminary support for Hypothesis 3a in chapter 3. As shown in Panel D of Table 4.2, the study obtains no evidence of any significant difference between firms that have the roles of CEO and board chair combined and firms that separate the two roles (both mean and median are not statistically different) implying that it does not count for monitoring financial reporting if the two roles are pooled together or separated. At this initial stage, no support is provided for Hypothesis 3b. The correlation analysis is next.

## 4.3 Correlation (bivariate) analysis

Table 4.3 presents the results of bivariate analysis using a two-way correlation matrix. The table shows the results of both Spearman rank correlation coefficients and Pearson correlation coefficients; the former are displayed above the diagonal line while the results of the latter are below the line. The two are presented for the mixture of both continuous variables and dummy variables in the models. In line with Chen et al. (2010) but in contrast with Marra et al. (2011), the study only shows the outcome of the full sample correlations rather than for pre-IFRS, post-IFRS and full samples since a dummy is employed to separate the two periods instead of conducting sub-sample (pre- and post-) multivariate analysis.

**Table 4.3 Correlation coefficients**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. ABS_AWCA | 1.0000 | 0.1078 | 0.1473* | -0.0345 | -0.0668 | -0.1019 | 0.0287 | 0.0395 | 0.0202 | 0.2383* | -0.0236 | -0.2987* | 0.1829* |
| 2. OUTDIR_PROP | 0.1254* | 1.0000 | 0.7773* | -0.0211 | 0.1442* | -0.0666 | 0.0711 | 0.3313* | 0.0048 | 0.2439* | 0.2849* | -0.0171 | -0.0078 |
| 3. OUTDIR_DOM | 0.1978* | 0.4651* | 1.0000 | 0.0232 | 0.3172* | -0.1478* | 0.2546* | 0.5574* | -0.0485 | 0.2509* | 0.4622* | -0.0412 | -0.0566 |
| 4. NODUAL | -0.0018 | -0.1119 | 0.0232 | 1.0000 | 0.0040 | 0.1568* | -0.1295* | 0.2272* | 0.0708 | 0.0295 | 0.2722* | 0.2184* | 0.0512 |
| 5. CONTR | -0.0496 | 0.1057 | 0.3172* | 0.0040 | 1.0000 | 0.0162 | 0.7907* | 0.1596* | 0.1309* | 0.0857 | 0.4218* | -0.0948 | -0.1003 |
| 6. IFRS | -0.1774* | -0.0479 | -0.1478* | 0.1568* | 0.0162 | 1.0000 | 0.0528 | -0.1820* | 0.0235 | 0.1591* | 0.1884* | 0.1543* | 0.1553* |
| 7. TOP1 | 0.0275 | -0.0218 | 0.2720* | -0.1391* | 0.7555* | 0.0627 | 1.0000 | 0.1092 | 0.1418* | 0.1665* | 0.3531* | -0.1668* | -0.2329* |
| 8. BSIZE | 0.0670 | 0.0711 | 0.5123* | 0.2402* | 0.1892* | -0.1397* | 0.1415* | 1.0000 | 0.0501 | 0.2174* | 0.5706* | 0.1109 | -0.1659* |
| 9. S_GROWTH | 0.3182* | 0.0123 | -0.0662 | 0.0587 | -0.0381 | -0.0463 | -0.0389 | -0.0312 | 1.0000 | -0.0184 | 0.1722* | -0.0037 | -0.1219* |
| 10.LEV | 0.1826* | 0.0630 | 0.1504* | 0.0444 | 0.0776 | 0.1656* | 0.1147 | 0.1461* | 0.0822 | 1.0000 | 0.0717 | -0.3313* | 0.3087* |
| 12. LOG_REV | -0.0037 | 0.0302 | 0.4773* | 0.2709* | 0.4378* | 0.1830* | 0.3821* | 0.5735* | -0.0451 | -0.0323 | 1.0000 | 0.3115* | -0.3344* |
| 13. A_QUA | -0.3712* | -0.0599 | -0.0412 | 0.2184* | -0.0948 | 0.1543* | -0.1266* | 0.1334* | -0.1783* | -0.3061* | 0.2986* | 1.0000 | -0.0708 |
| 14. LAG1_LOSS | 0.2300* | 0.0856 | -0.0566 | 0.0512 | -0.1003 | 0.1553* | -0.2239* | -0.1434* | 0.1138 | 0.3708* | -0.3502* | -0.0708 | 1.0000 |

_Notes:_
**_Spearman correlations are reported above the diagonal and Pearson pairwise correlations are reported below the diagonal._**
_*, ** and *** indicate significance at p<0.10, p<0.05 and p<0.01 respectively_

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Conforming to expectation and consistent with a lot of extant literature such as Bova and Pereira (2012), the matrix table shows that IFRS are significantly and negatively correlated with abnormal accruals; this comes at the 5% significance level. The results yield a further preliminary evidence that firms report lower unexpected working capital accruals subsequent to the IFRS introduction in Ghana. This corroborates the t-test results and provides early evidence to support Hypothesis 1. With respect to controlling shareholding, the findings show that controlling shareholding does not have statistically significant associations with abnormal working capital accruals even though there is a negative

(positive) sign attached to the coefficients in the Pearson (Spearman) correlation matrix.

This is in line with the results of the t-test and Wilcoxon Rank-sum test. Ultimately, Hypothesis 2 is at this early stage not supported. Regarding outside directorship, both proportion of outside directors and non-duality are associated with the absolute value of abnormal working capital accruals at an insignificant level. While the proportion of external directors represented on the board in respect of the two measures relates positively and significantly with abnormal accruals, divergence between the CEO's position and chair's position correlates negatively but insignificantly with abnormal accruals. Only the continuous measure of outside director representation is consistent in terms of its statistically significant and positive association with low earnings quality. On the basis of the foregoing findings, early support is garnered for Hypothesis 3 but not for Hypothesis 4. Worthy of note, the results identify with those given by the t-test and Wilcoxon Rank-sum

test.

For the control variables, it can be observed that four out of the seven primary control variables considered in the study are associated with abnormal accruals at statistically significant level. Amongst the four variables, it is only the use of quality auditors that seem

likely to constrain earnings management practice; leverage, prior year negative profits and growth positively correlate with abnormal working capital accruals. This is consistent with the results of the Spearman rank correlation matrix except for growth that exhibits insignificantly positive association with the level of abnormal accruals. It appears with Pearson (Spearman) correlation coefficients of -0.3172 (-0.2987) at 10% significance level, audit quality is the most important factor which influences the level of abnormal accruals downwards at the bi-variate analysis level.   Thus, firms audited by the Big Four auditors are associated with lower level of non-directional earnings management while more levered, poor performing and growing firms have more abnormal accruals. Attention is now turned to present the results of the multivariate analysis in the next section.

## 4.4 Multivariate analysis

This section presents the results of the multivariate analyses in order to obtain more rounded evidence than those reported by the univariate and bi-variate analyses. The regressions are run to test the formulated hypotheses.

Using abnormal accruals operationalized by absolute value of abnormal working capital accruals as dependent variable, the study employs two main models in order to systematically explore for the kind of role played by the main explanatory variables in relation to abnormal accruals. The first model clusters all the four main explanatory variables as outlined above into a single equation together with empirically supported controls but without any interaction terms between IFRS dummy and the other three predictor variables. The second model incorporates all the explanatory and control variables contained in Model 1 and in addition, contains three interaction terms between IFRS dummy and each one of the other three explanatory variables. This is to find out whether IFRS impact (if any) varies between two

different firm-years but across all the other three explanatory variables allowing for IFRS impact as follows: a) between firm-years in which there is controlling shareholder and those in which there is none; b) between firm-years with outside dominated board and those with inside dominated board; and c) between duality and non-duality firms. Before proceeding to show the various regression results obtained for the two models, the next sub-section first presents the outcome of the various data and regression diagnoses made prior to the final estimations.

### 4.4.1 Data and regression diagnoses

The sub-section presents the results of the following tests: a) normality of residuals; b) multicollinearity; c) serial correlation; d) heteroskedasticity; e) joint time effects and industry effects; and f) appropriate panel model specification.

### Normality of residuals

In testing for residuals normality, the study relies on two graphical approaches: Kernel Density (Kdensity) and probability of normality plot (p-norm). This resolve closely aligns with Marra et al. (2011) who employ normal probability plot to check for normality of residuals rather than testing for normality of individual variables. Gujarati (2003) discusses this issue at length when he mentions that normality in regression is with residuals rather than with individual variables since the latter is not an end in itself but means to the former. Hence, the former matters more than the latter because if normally distributed variables do not lead to normal residuals then the parametric assumption of normality is still violated. The normality plots using the two graphical methods are shown in Appendix 1. Appendix 1 presents both probability of normality plot and Kernel Density estimate for each of the three models; Models 1a, 1b and 2. In all of the three cases, deviation from normality benchmark

does not look so precarious that one would construe non-normality. The p-norm plot uses a straight thin line drawn diagonally as a standard measure of normality while the Kdensity matches the residual normality curve of a model to a default normality curve. Both judge a model as normal if its own plot exactly overlays the benchmark curve. However, the slight deviation in all cases does not equally suggest violation of normality since minor variations seem as almost always to be expected (Marra et al. 2011).

**Multicollinearity**

Following previous studies including Ding et al. (2007), Marra et al. (2011) and BonaSanchez, Perez-Aleman and Santana-Martin (2011), the study checks for multicollinearity using correlation coefficients, and variance inflation factor (VIF) and its inverse measure called tolerance index (see O'brien, 2007). High correlation coefficients between individual explanatory variables suggest the presence of multicollinearity problem; more specifically, Gujarati (2003) submits that coefficients exceeding 0.80 present serious problem of multicollinearity. In relation to VIF or tolerance, O'brien (2007) mentions that the most commonly used rule of thumb to indicate the presence of serious collinearity issue is if VIF is greater than 10 or tolerance less than 0.10. Such scholarly papers as Marquardt (1970) and Menard (1995) give credence to O'brien's (2007) claim.

The correlation matrices presented earlier in Table 4.3 under the correlation analysis put the highest coefficient score at 0.4651 being the measure of the bivariate relationship between the continuous measure of proportion of outside directors and the corresponding dichotomous measure. The score falls widely below the suggested rule of thumb mark of 0.80. Moreover, the study considers the VIF values of all the variables including both explanatory and control variables incorporated into each of all of the three main models and finds none of these values exceeding the threshold mark of 10 indicating absence of serious multicollinearity issue.

From Table 4.4, it can be observed the highest VIF values in models 1a, 1b and 2 are 2.83,

3.12 and 7.33 respectively. Accordingly no tolerance index falls

below 0.10 across the models.

**Table 4.4 Variance Inflation Factor (VIF) Results**

| Model 1a | | | Model 1b | | | Model 2 | | |
|---|---|---|---|---|---|---|---|---|
| **Variables** | **VIF** | **1/VIF** | **Variables** | **VIF** | **1/VIF** | **Variables** | **VIF** | **1/VIF** |
| TOP1 | 2.83 | 0.353042 | LOG_REV | 3.12 | 0.320908 | IFRS | 7.33 | 0.136433 |
| CONTR | 2.82 | 0.354210 | TOP1 | 2.75 | 0.363934 | IFRS*NODUAL | 7.27 | 0.137474 |
| LOG_REV | 2.77 | 0.361219 | CONTR | 2.74 | 0.364853 | IFRS*CONTR | 5.06 | 0.197758 |
| BSIZE | 1.86 | 0.536470 | BSIZE | 1.98 | 0.505087 | CONTR | 4.93 | 0.202698 |
| LAG1_LOSS | 1.58 | 0.634316 | OUTDIR_DOM | 1.71 | 0.585824 | IFRS*OUTDIR_DOM | 3.25 | 0.307453 |
| LEV | *1.49* | 0.669820 | LAG1_LOSS | 1.62 | 0.78810 | LOG_REV | 3.21 | 0.311171 |
| A_QUA | 1.44 | 0.696813 | LEV | 1.50 | 0.585824 | OUTDIR_DOM | 3.16 | .316854 |
| IFRS | 1.35 | 0.739171 | A_QUA | 1.46 | 0.618124 | TOP1 | 2.77 | 0.361086 |
| NODUAL | 1.28 | 0.781080 | IFRS | 1.42 | 0.682656 | NODUAL | 2.52 | 0.396126 |
| OUTDIR_PROP | 1.08 | 0.923999 | NODUAL | 1.26 | 0.792221 | BSIZE | 2.11 | 0.474054 |
| S_GROWTH | 1.07 | 0.936497 | S_GROWTH | 1.08 | 0.925666 | LAG1_LOSS | 1.62 | 0.615445 |
| | | | | | | LEV | 1.50 | 0.664522 |
| | | | | | | A_QUA | 1.48 | 0.673981 |
| | | | | | | S_GROWTH | 1.10 | 0.906169 |
| Mean VIF | 1.78 | | | 1.88 | | | 3.38 | |

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This therefore suggests that no serious multicollinearity exists in the models. Noteworthy nonetheless, the value of 7.33 seems worrisome given that it stays close to the threshold and far apart from the other two. However, that does not look unexpected since it relates to the Model 2 which contains various interaction terms. On the whole, the author is not wary of the presence of any serious collinearity issues in the analyses.

**Serial correlation**

Serial correlation occurs when there is temporal dependence in the residuals which causes a situation where both the t-values and confidence levels become inaccurate. In testing for the presence of serial correlation, ―xtserial‖ Stata command is applied to run the Woodridge's test of autocorrelation on all the three models. In all of the cases however, the test does not reject the null hypothesis of first-order autocorrelation given that the pvalues in the regression results table, Table 4.5 are nowhere near zero. In particular, the results show that the lowest p-value across all the three models is above 0.40. This means that serial correlation is not an issue to address in this study.

**Heteroskedasticity**

Gujarati (2003) describes heteroskedasticity as a model problem which occurs when the variance of the error terms does not remain constant and in such a situation, the OLS estimator is no longer efficient since the efficiency of OLS estimation depends on the variance staying homogenous. In panel data analysis, the issue of heteroskedasticity should be expected (Long and Ervin, 2000). In the presence of heteroskedasticity, the estimations of homoscedasticity assumed model, the pooled OLS, still remain unbiased but inefficient. Such estimations deflate standard errors leading to enhanced t-values (reduced p-values) which, in turn, lead to failure to refuse to reject the null hypothesis.

Thus, in this situation, estimation with heteroskedasticity corrected standard errors becomes more appropriate than that made with conventional standard errors since the former is likely to yield more valid p-values of the coefficients.

In testing for heteroskedasticity, the study applies normal-distribution-assumed BreuschPagan/Cook-Weisberg test (employing a Stata 13.1 command, *estat hettest*). The study also shows distribution plots of the fitted values against the residuals of the pooled OLS estimations of the models. The results of the Breusch/Cook-Weisberg test in Table 4.5 produce p-values of 0.000 across all the models suggesting that the null hypothesis of constant variance is rejected at 1% significant level. The post-estimations therefore confirm the prior belief that heteroskedasticity problem is present in the dataset. Further, the extent of the rejection of constant variance of the residuals seems too pernicious not to consider correcting. This holds even truer by looking at the residual-versus-fitted value plots in Appendix 2. For equal variance, the plotted points should be drawn so close to the origin of plot but this is not the case in all the three plots. Hence, in line with Cameron,

Gelbach and Miller (2008), Baltagi, Jung and Song (2010) and Cameron and Miller (2015), the study uses OLS estimations augmented with heteroskedasticity corrected standard errors. In this regard, the study employs the variance-covariance estimator (vce) heteroskedastic covariance 3 (HC3) suggested by Davidson and MacKinnon (1993), as cited in Long and Ervin (2000), to be the most appropriate robust standard error estimator when correcting for heteroskedastic error in finite sample size (i.e. if there are 250 or fewer observations). The maximum number of observations used in this study is less than 200.

**Time and industry effects**

In order to find out whether it matters to incorporate year dummies and industry dummies to control for any potential time fixed effects and industry fixed effects respectively. In line

with Bona-Sanchez et al. (2011), Wald tests of joint significance of time and industry dummies are performed. The industry classification follows the approach adopted in Greif (2012). Greif groups all non-financial firms using only three classifications instead of the GSE's own classifications. Following his approach allows much more even representation in the various industry groups. Specifically, he classifies non-financial firms into consumer, manufacturing and services. Details of the classification are provided in Appendix 12 Panel A. The results of these tests are reported in Table 4.5 and suggest that the null hypothesis of nil joint effects is rejected for both time and industry effects. This implies that it means nothing to incorporate these two fixed effects in the models as potentially no within industry effects and temporal shocks exist to control for.

**Specification of model estimator**

In specifying the appropriate panel data estimator for the three models from among the three specifications: pooled OLS, RE and FE estimations, the study follows three steps. First, a choice is made between RE estimation and pooled OLS estimation using BreuschPagan (1980) Lagrange Multiplier (LM) test for random firm effects. Second, a choice is made between FE estimation and pooled OLS estimation using Hausman type test. Third and last, a choice is made between FE and RE estimations using Hausman type test. The tests results are found in Tables 4.5.

The results of the three tests are as follows. First, the results of the Breusch-Pagan LM tests of random effects of all the three models as reported in the two tables consistently reject the null hypothesis of data poolability at 1% statistically significant level due to the presence of unobserved heterogeneity. Second, the results of Hausman tests to decide between FE and OLS estimations show in all cases that the null hypothesis of poolability should not be rejected. In particular, each of the resultant p-values for the three models is in excess of 0.50.

Apparently, it is obvious that the RE estimation is the most appropriate going by the results presented above. Whereas the pooled OLS is preferred to the FE estimation, the LM tests reject the pooled regression in favour of the RE estimation. However, the study goes ahead to present the results of Hausman-based tests of systematic differences in coefficients between RE and FE estimations in order to confirm the superiority of the RE models. The results of these tests suggest in all cases that the null hypothesis of no systematic difference between FE and RE estimated coefficients cannot be rejected given that p-values are far away from zero. In this case, both estimators will yield consistent regression outcomes. However, for higher efficiency gains the study employs the RE estimator as the primary estimator for all the abnormal accrual models. The RE model is also more appropriate in this study because some of the governance variables are sticky over time (Liu and Lu, 2007). Moreover, the RE estimations become more appropriate for this study because these estimations unlike the FE assume that the unobserved individual effects are random and not controlled for. Baltagi (2005) indicates that the FE model in controlling within effects introduce too many parameters which often result in loss of degrees of freedom especially in micro panels where units are larger than time period. Further, Clark and Linzer (2015) document that RE model produces more valid results than FE model in small samples (they use 250 observations or less) regardless of whether underlying assumptions are met or violated. Last, the RE model permits better generalizability of findings especially when sample is randomly determined (Baltagi, 2005, p.14).

The study uses both RE estimations and pooled OLS rather than FE estimations since data pooling is found to be better than FE estimations. In fact, extant literature on earnings quality indicates that application of the OLS estimator is suitable especially when the researcher is interested in utilizing the heterogeneity in observations. However, in line with Baltagi (2005), Liu and Lu (2007) and Brown et al. (2011), the study still reports FE estimations

later as a way of robustness check and in an attempt to control for any possible endogeneity issues. The presence of endogeneity defies an important assumption of exogeneity that underlies simple OLS regressions. The regression results of the models based on heteroskedastic OLS and RE estimations are presented next.

## 4.4.2 Regression results

These results are presented in Table 4.5. The table contains six columns. The first three columns report the heteroskedastic pooled OLS regression results for the three models. The second three columns present the results of RE estimation of the three models. The RE estimations are run and reported using the conventional standard errors and this is consistent with Liu and Lu's (2007) approach and Greene's (2003 pp. 316) suggestion that in the presence of heteroskedasticity RE estimation (with unadjusted standard errors) better allows the disturbance variance to vary across groups. Greene (2003) again argues that OLS with robust standard errors is still not efficient while Generalized Least Square (GLS) RE estimator is efficient. Thus, the study relies on the results of the RE estimator for the analysis and the discussion. However, the results of the two estimators are shown to check for consistency in estimations of coefficients and their significance.

It can be observed from the Table 4.5 above that the overall fitness F-statistic is significant at 1% across all the regression models under both OLS and RE estimations indicating that the joint effects of the coefficients are significantly different than zero. The coefficients of determination, the adjusted $R^2$ in the case of the OLS estimation and the overall $R^2$ in the case of RE estimation,are consistently higher than 30% which is reasonable in the context of abnormal accruals studies (see Xie et al. 2003; Liu and Lu, 2007; Ding et al. 2007; Peni and Vahamaa, 2010; Siagian and Tresnaningsih, 2011; González and García-Meca, 2014). This suggests that at least the models explain the behaviour of dependent variable about

30%. The results of each of the three models under both pooled OLS with heteroskedastic standard errors and RE estimations are presented separately as follows. The results of Model 1 are presented first.

**Results of Model 1**

Model 1 is used to test for the direct effects of IFRS adoption, controlling shareholding and outside directorship on abnormal accruals. In this way, Hypotheses 1 – 3 are tested using this model. As mentioned earlier, the model is split into two: Models 1a and 1b.

**Table 4.5:Main regression results: Models 1a, 1b and 2**

*The table reports estimated coefficients, t-values and significance levels from both OLS and RE estimations with absolute value of abnormal working capital accruals scaled by year-end book value of total assets as the dependent variable. Columns 1 to 3 display the pooled OLS results while Columns 4 to 6 show the RE results.*

| Estimations | | OLS | | | RE | |
| --- | --- | --- | --- | --- | --- | --- |
| | Model 1a (1) | Model 1b (2) | Model 2 (3) | Model 1a (4) | Model 1b (5) | Model 2 (6) |
| INTERCEPT | -0.276* | -0.132 | -0.157 | -0.249** | -0.0906 | -0.113 |
| | (-1.95) | (-1.05) | (-1.10) | (-1.98) | (-0.75) | (-0.85) |
| IFRS | -0.0666** | -0.0604** | -0.0704 | -0.0636*** | -0.0576*** | -0.0537 |
| | (-2.23) | (-2.02) | (-1.42) | (-3.42) | (-3.06) | (-1.24) |
| CONTR | -0.104*** | -0.0974*** | -0.0996*** | -0.0905*** | -0.0868*** | -0.0814** |
| | (-3.28) | (-3.24) | (-2.92) | (-3.02) | (-2.89) | (-2.14) |
| OUTDIR_PROP | 0.107** | - | - | 0.108 | - | - |
| | (2.14) | - | - | (1.32) | - | - |
| OUTDIR_DOM | - | 0.0360* | 0.0741** | - | 0.0498* | 0.0720** |
| | - | (1.88) | (2.03) | - | (1.79) | (2.17) |
| NODUAL | 0.0179 | 0.0159 | -0.00691 | 0.0450* | 0.0442* | 0.0320 |
| | (0.74) | (0.67) | (-0.18) | (1.67) | (1.66) | (0.90) |
| IFRS*CONTR | - | - | -0.00170 | - | - | -0.0140 |
| | - | - | (-0.05) | - | - | (-0.41) |
| IFRS*OUTDIR_DOM | - | - | -0.0753* | - | - | -0.0478 |
| | - | - | (-1.73) | - | - | (-1.25) |
| IFRS*NODUAL | - | - | 0.0426 | - | - | 0.0232 |
| | - | - | (0.94) | - | - | (0.56) |
| TOP1 | 0.148** | 0.128* | 0.139** | 0.169** | 0.153** | 0.170** |
| | (2.07) | (1.86) | (2.01) | (2.25) | (2.00) | (2.08) |
| BSIZE | -0.00345 | -0.00518 | -0.00299 | -0.00185 | -0.00502 | -0.00249 |
| | (-0.62) | (-0.90) | (-0.55) | (-0.28) | (-0.71) | (-0.33) |
| S_GROWTH | 0.0309** | 0.0327** | 0.0342** | 0.0312*** | 0.0321*** | 0.0333*** |
| | (2.21) | (2.32) | (2.15) | (3.28) | (3.39) | (3.47) |
| LEV | -0.0154 | -0.0169 | -0.0155 | -0.0235 | -0.0199 | -0.0185 |
| | (-0.44) | (-0.48) | (-0.45) | (-0.74) | (-0.62) | (-0.56) |

| | | | | | | |
|---|---|---|---|---|---|---|
| LOG_REV | 0.0238** | 0.0208** | 0.0211** | 0.0188** | 0.0150* | 0.0142 |
| | (2.43) | (2.09) | (2.13) | (2.27) | (1.73) | (1.53) |
| LAG1_LOSS | 0.110** | 0.106** | 0.105** | 0.109*** | 0.108*** | 0.109*** |
| | (2.54) | (2.40) | (2.44) | (4.44) | (4.38) | (4.36) |
| A_QUA | -0.113*** | -0.110*** | -0.111*** | -0.104*** | -0.0978*** | -0.0941*** |
| | (-3.70) | (-3.53) | (-3.62) | (-3.94) | (-3.66) | (-3.33) |

*CONTINUATION*

| | Model 1a | Model 1b | Model 2 | Model 1a | Model 1b | Model 2 |
|---|---|---|---|---|---|---|
| Within $R^2$ | - | - | - | 25.5% | 26.7% | 37.2% |
| Between $R^2$ | - | - | - | 53.9% | 50.5% | 27.6% |
| Overall $R^2$ | - | - | - | 36.0% | 35.8% | 53.2% |
| Adjusted $R^2$ | 33.1% | 32.98% | 33.8% | - | - | - |
| Significance (F-statistics) | 0.0002 | 0.0001 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| †† Breusch-Pagan LM test (RE versus OLS) | 0.0015 | 0.0008 | 0.0025 | 0.0015 | 0.0008 | 0.0025 |
| Hausman test (FE versus OLS) | 0.8682 | 0.5515 | 0.5526 | 0.8682 | 0.5515 | 0.5526 |
| Hausman test (FE versus RE) | 0.6985 | 0.6542 | 0.9651 | 0.6985 | 0.6542 | 0.9651 |
| Time effects Wald test | 0.5660 | 0.5703 | 0.5467 | 0.5660 | 0.5703 | 0.5467 |
| Industry effects Wald test | 0.4527 | 0.1739 | 0.1269 | 0.4527 | 0.1739 | 0.1269 |
| Serial correlation test | 0.4926 | 0.4444 | 0.4282 | 0.4926 | 0.4444 | 0.4282 |
| Heteroskedasticity tests: | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Standard Error | HC3 | HC3 | HC3 | OLS | OLS | OLS |
| Observations | **187** | **187** | **187** | **187** | **187** | **187** |

*Note: t-statistic is reported in parenthesis; *, ** and *** indicate significance at p<0.10, p<0.05 and p<0.01 respectively. ††: Only the significance values (p-values) are reported for the various Wald and postestimation tests. The null for each test is only rejected at the conventional 5% significance level.*

*Equations for Models 1a, 1b and 2 respectively are provided below:*

$$ABS\_AWCA = a_0 + a_1 IFRS_{it} + a_2 CONTR_{it} + a_3 OUTDIR\_PROP_{it} + a_4 NO\_DUAL_{it} + a_5 TOP1_{it} + a_6 BSIZE_{it} + a_7 S\_GROWTH_{it} + a_8 LEV_{it} + a_9 LOG\_REV_{it} + a_{10} LAG1\_LOSS_{it} + a_{11} A\_QUA_{it} + \varepsilon_{it}$$

$$ABS\_AWCA = a_0 + a_1 IFRS_{it} + a_2 CONTR_{it} + a_3 OUTDIR\_DOM_{it} + a_4 NO\_DUAL_{it} + a_5 TOP1_{it} + a_6 BSIZE_{it} + a_7 S\_GROWTH_{it} + a_8 LEV_{it} + a_9 LOG\_REV_{it} + a_{10} LAG1\_LOSS_{it} + a_{11} A\_QUA_{it} + \varepsilon_{it}$$

$$ABS\_AWCA = a_0 + a_2 IFRS_{it} + a_3 CONTR_{it} + a_4 OUTDIR\_DOM_{it} + a_5 NO\_DUAL_{it} + a_6 IFRSit*CONTR_{it} + a_7 IFRSit*OUTDIR\_DOM_{it} + a_8 IFRS_{it}*NO\_DUAL_{it} + a_9 TOP1_{it} + a_{10} BSIZE_{it} + a_{11} S\_GROWTH_{it} + a_{12} LEV_{it} + a_{13} LOG\_REV_{it} + a_{14} LAG1\_LOSS_{it} + a_{15} A\_QUA_{it} + \varepsilon_{it}$$

The two models are similar in all respects except that Model 1a measures outside director representation on company board by a continuous measure while Model 1b separates outside dominated and inside dominated board by using a dichotomous measure which is given a value of 1 to indicate outside domination if the proportion of outside directors on the board exceeds the $50^{th}$ percentile proportion cut-off point and 0 to indicate inside domination if otherwise. The regression results of Model 1a and Model 1b are found in the Columns 1 and 4 and Columns 2 and 5 respectively.

**Model 1a**

These results are reported in Columns 1 and 4 based on OLS and RE estimations respectively. From Column 1, it can be found that the absolute value of abnormal working capital accruals deflated by total assets at year-end is related significantly and negatively to both IFRS adoption ($IFRS$ = -0.0666; $p < 0.05$) and controlling shareholding ($CONTR$ = -0.104; $p < 0.01$). Specifically, on a pooled average and after holding other things constant, firms experienced about 0.0666 decline in the level of abnormal working capital accruals after switching from GNAS to IFRS while firms with controlling shareholders recorded a 0.104 less level of non-directional abnormal working capital accruals than uncontrolled firms did. The significant association of IFRS adoption in the multivariate analysis confirms the outcomes of both univariate and bivariate analyses indicating that the quality of accounting standards affects the quality of financial reports. However, the results obtained for the controlling shareholding are at variance with the results of the two previous sets of analysis suggesting that it is appropriate the study controls for the other determinants of abnormal accruals. Thus, support is garnered for Hypotheses 1 and 2. The other two explanatory variables, the proportion of outside directors and separation between the CEO

and the chair's positions, are positively associated with abnormal accruals. However, this relationship is only significant with outside director representation (*OUTDIR_PROP* = 0.107; $p < 0.05$) but not with role separation. The estimated coefficient associated with the outside director representation seems substantial. If the results were true, then ceteris paribus for every additional 10 percentage points of the outside director representation obtained by a firm its unsigned abnormal working capital accruals scaled by total assets, on average, will increase by 1.07 (0.107*10) or 107%. This looks reasonably worrisome. Meanwhile, the positive sign carried by the estimated coefficient on *NODUAL* is inconsistent with the sign it carries in both Pearson's pairwise and Spearman's correlation analyses.

For the control variables, the findings show that abnormal accruals are strongly positively associated with the level of holdings by the top one shareholder (at 5% significance level), growth in scale of activity (at 5% significance level), size – natural log of revenue (at 5% significance level) and previous one year bad performance – loss year (at 5% significance level). This means that firms with concentrated shareholding, with higher growth rate, with larger revenue base and with previous one year loss tend to manage earnings more. However, board size, leverage and audit quality do exhibit negative relationship with the level of abnormal accruals. Consistent with expectation, the relationship is statistically significant with audit quality at 1% significance level but not with the others. This also implies that it pays off through decline in the production of poor financial reports to contract global and more resourced auditing firms to audit financial statements in Ghana, at least for most of the listed firms. While pooled regression result for leverage does not tally with the early results of the Pearson's correlation analysis, the board size does. Thus, firms neither manipulate earnings upwards to avoid debt covenant violation nor do so downwards in order to attract favourable treatments from lenders. Also, appointing many directors does not result in improved quality.

Column 4 gives the results of the RE estimation for Model 1a. These results are so close to those reported in Column 1. With a slight dip in the magnitude of its estimated coefficient, *IFRS* is still negatively and significantly associated with earnings management with significance at 1% level. Compared to the less consistent OLS estimation, the RE estimation shows that a transition of firm from reporting earnings under GNAS to reporting under IFRS, all other things being held constant, should reduce abnormal working capital accruals (whether positive or negative) by 0.0636 rather than by 0.0666 as reported in Column 1. The existence of a controlling shareholder is again negatively and highly significantly related to abnormal accruals. The significance level stays unchanged at 1% level. The estimated coefficient rather faces a small decline from 0.104 in Column 1 to 0.0905 in Column 4. Thus, the null forms of both Hypotheses 1 and 2 are rejected. With respect to outsider directorship, its ineffectiveness does not reverse after allowing for the disturbances within the residuals to vary across observations as both outside board proportion (a continuous measure) and roles separation have maintained positive association with earnings opacity. However, the association has now turned significant for role splitting at 10% level rather than for the outside board representation. Worthy to note is the marked surge in the estimated coefficient (coefficient of 0.0450) for non-duality variable which is about three times larger than that obtained in Columns 1 and 2 (coefficient of 0.0179). On the basis of the results in Column 4, the test does not reject the null of Hypothesis 3a while it does the null of Hypothesis 3b.

From observation of the control variables, the results of RE estimation indicate as before that firms audited by the Big Four auditing firms are significantly associated with lower level of unsigned abnormal working capital accruals whereas firms that reported losses a year before, firms with higher concentration of shares in the top one shareholder, big firms in terms of revenue generation and high growing firms are significantly associated with

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larger unsigned abnormal accruals. Firms with larger board size and more reliance on debts are associated with lower level of abnormal accruals at insignificant level.

Generally, the results are qualitatively identical with the OLS results. The results of Model 1b are presented next.

**Model 1b**

The OLS estimations for Model 1b are shown in Column 2 of Table 4.5 while the RE estimation is provided in Column 5. In Model 1b, the study only replaces the continuous measure of outsider director representation with a dichotomous measure to separate firms with outside dominated board from those with inside dominated board. Consistent with the results of Model 1a in Columns 1, and the univariate and the bivariate analyses, the results reveal that IFRS adoption is statistically significant in restricting the level of the unsigned value of abnormal working capital accruals scaled by total assets at 5% significance level. The presence of controlling shareholder still has a strongly significant (at 1% significance level) and inverse association with unsigned unexpected accruals. Just as the continuous measure of outside director representation, *OUTDIR_DOM*, exhibits a positive association with abnormal accruals indicating that the more the proportion of outside directors increases the less informative the reported earnings become. This implies the board is still naïve even when many more outside members sit on it. However the relationship is nearly insignificant or weakly significant (at 10% significance level). Role separation still shows an insignificant, positive relationship. Regarding the controls, the signs and magnitude of estimated coefficients and significance levels of the variables reported in Column 2 are virtually the same as those reported in Column 1.

In Column 5, the results of RE model show that size, direction and significance level of the coefficient estimate on the IFRS measure are not affected much after replacing the

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continuous measure of outside board representation with the dichotomous measure in the RE estimation. This suggests that the results obtained for IFRS are immune to different estimations. The finding again does not affect the relationship that firms which are controlled by a major shareholder have significantly lower level of abnormal accruals.

*CONTR* remains significant at 1% level and continues to have inverse association with the dependent variable. More importantly, the introduction of the dichotomous measure causes both outside director measures to show positive and significant association with the abnormal accruals measure. And not only that, the estimated coefficients on the two board-related variables have gone higher than those in Columns 2. This means that ceteris paribus, firms characterized by outside dominated board provide management with more opportunity to manipulate the firm's earnings. Thus, the study gains support for Hypothesis 3a now but not 3b.

The behaviour of all the control variables remains the same except that there are slight differences in the level of estimated coefficients and significance level from the pooled results. Audit quality is still negatively and significantly associated with the dependent variable whereas top one shareholding, lagged loss year and growth in sales are significantly associated with higher level of abnormal accruals. The insignificant and positive relationship between board size and leverage and poor earnings quality under the pooled regressions has also not changed the RE estimation. The author presents the results of Model 2 next.

**Results of Model 2**

The study tests Hypotheses 4a, 4b and 4c using the results of Model 2. Under this section, the results of both OLS and RE estimations of Model 2 are presented to find out whether and how controlling shareholders and outside directors influence abnormal accruals after the adoption of IFRS. The study uses three interaction terms to capture any incremental effects

of controlling shareholder, outside dominated board and outside board chairperson on abnormal accruals in the post-IFRS period. The study considers only the dichotomous measure of outside directors in the interaction model because an attempt to use the continuous measure leads to high VIFs suggesting that the measure is highly collinear with the IFRS dummy. Columns 3 and 6 of Table 4.5 provide the results of Model 2. Column 3 presents the pooled regression results with corrected standard errors and Column 6 provides the results of the RE estimation. The focus, here, is on the interaction terms.

With particular attention paid to the three interaction terms, *IFRS*CONTR*,

*IFRS*OUTDIR_DOM* and *IFRS*NODUAL*, the following findings become observable. In Column 3, it can be noticed that respectively, *CONTR* and *OUTDIR_DOM* still have significantly negative impact (with coefficient of -0.0996 and p < 0.01) and significantly positive impact (with coefficient of 0.0741 and p < 0.01) on the extent of earnings management. The variable, *NODUAL,* has an insignificant and negative association with abnormal accruals. From the results of the RE estimation reported in Column 6, both *CONTR* and *OUTDIR_DOM* maintain their directions but the estimated coefficients (and their significance level) on *CONTR* and *OUTDIR_DOM* change from -0.0996 (significant at 1%) to -0.0814 (significant at 5%) and from 0.0741 (significant at 5%) to 0.0720 (significant at 5%) respectively. The sign to the coefficient of *NODUAL* changes from negative to positive in the RE estimation. Meanwhile IFRS dummy loses significance across both estimations. In Column 3, regarding the interaction terms, the findings suggest that the marginal effects of the controlling shareholder and independent board in the postIFRS period are both negative but only significant (at 10%) for outside dominated board suggesting that outside directors become less ineffective in constraining earnings management when the reporting requirements are elaborate. Differently put, firms with very high level of outside directors benefit more from IFRS adoption than those with more insiders. In Column 6, however,

when the disturbances in the error term are allowed to interact across observations the statistical significance of the marginal effects of *OUTDIR_DOM* is lost but the sign has not changed. Overall, the study finds that the constraining incremental impact of both controlling shareholders and outside dominated board as evidenced by the coefficients of *IFRS\*CONTR* (which is -0.0478) and *IFRS\*OUTDIR_DOM* (which is -0.0140), are not statistically significant. However, as Miller and Rodgers (2008) argue, the lack of significance of the estimates may be due to the low degree of freedom as occasioned by the use of many variables against finite sample size as it is in this model. Consistently, the coefficient of *IFRS\*NODUAL* is insignificant and positive across various estimations suggesting that the change in accounting standards has not improved the monitoring effectiveness of independent chairpersons or conversely, independent chairpersons are not able to or do not exploit the more quality standards to oversee the financial reporting process. Thus, the study obtains no support for Hypotheses 4a and 4c but finds a weak support for Hypothesis 4b.

The control variables are essentially the same as in the results of the two estimation for Models 1a and 1b. The additional analyses are considered next in an attempt to check for the sensitivity of the results to various issues.

## 4.5 Additional analyses and robustness checks

The following eight additional analyses are performed separately in order to gain wider understanding and also strengthen the results already obtained:

a. First, the definition of outside dominated board is modified. Specifically, the study changes the cut-off proportion from 50th percentile to 25th percentile and 75th percentile proportions. After this, both Models 1b and 2 are re-estimated using the primary model,

the RE model for each one of the two measures to check whether the results obtained for outside director domination are robust to alternative definitions;

b. Second, the study discards the unbalanced panel data structure and uses a balanced dataset to rerun all the three models using RE estimator in order to reduce any possible suspicion the results obtained especially for the IFRS dummy are driven by confounding effects;

c. Third, an alternative measure of size is considered. Many papers measure size by taking a natural log of total assets rather than of revenue. Therefore, the study replaces log of revenue with log of assets and reruns all the three models using the RE estimator;

d. Fourth, by recognizing that performance as measured by return on assets (ROA) has been used a lot in prior earnings management studies, variable, ROA, is added to those in the original models. Using the RE estimator, the models are rerun to check whether the results obtained earlier are biased by omitted variables;

e. Fifth, scholars also argue that cash flows from operations have association with accruals. High cash flows are expected to result in lower accruals (Dichev and Dechow, 2002). Therefore, the study adds cash flow from operations (CFO) measured as the net cash flows from operating activities scaled by beginning total assets in line with Marra et al. (2011) to produce new RE estimation of all the three models;

f. Sixth, the study entertains the three models with yet another estimator, the FE estimator, for two reasons: i) to check whether the results obtained are robust to alternative model specification; and ii) to minimize any possible endogeneity problem that is often present in corporate governance studies (Liu and Lu, 2007) and see how the results look like;

g.  Seventh, by considering the dominant forms of concentrated ownerships in Ghana, the study splits controlling shareholding into three major constituents including state controlling shareholding, foreign controlling shareholding and locally private controlling shareholding. Using the split data, the RE estimation of Models 1a and 1b is rerun to check for the direct effects of each of the three components.

h.  Last, for robustness of the results to the abnormal accruals construct, the study uses an alternative measure, which is the absolute value of abnormal working capital accruals scaled by revenue rather than by total assets and new RE estimations of all the Models are generated.

### 4.5.1 New definition for outside director representation

It is possible that results obtained for outside director representation could be driven by poor measurement of the construct. So by following Wang and Yung (2011) who define state ownership using several cut-offs, the present study introduces two additional cut-offs to distinguish between high and low outside board representation. Paying attention to the descriptive statistics, the study employs both 25th percentile and 75th percentile marks as new cut-offs to reorganize the data into inside and outside dominated boards. From Table 4.1, the descriptive statistics show that the 25th percentile coincides with non-executive director proportion of 75% of total board size while the 75th percentile is 88% proportion. The reason for selecting the two thresholds is that number of observations falling within the upper 75th and 25th percentiles is likely to be quite different from the number that falls within the upper 50th percentile. The results of these new RE estimations are found in Appendix 3.

From Appendix 3, it can be noticed that outside directors are still associated with higher level of abnormal accruals suggesting that in whatever case having a few or many outside

directors only comes to encourage more extraction. The relationship, however, is significant (at 5% level) in the case of 75th percentile cut-off point. All the other variables including the controls have kept their directions with only marginal changes in the coefficients and their significance. It can be observed from Column 3 that the coefficient of outside director variable, *OUTDIR_DOM75*, has gained more statistical significance and turned significantly negative (at 1%) when interacted with *IFRS* suggesting that in the post-IFRS era, the extent of outside director ineffectiveness in constricting earnings manipulation reduces to 0.034 (i.e. 0.141 plus -0.107) with a marginal negative impact of 0.107. The impact of high outside board membership using the 25th percentile threshold offers no statistically useful insight into understanding the behaviour of abnormal accruals.

### 4.5.2 Balanced data

Critics may apparently raise suspicion about the unbiasedness in results especially for the IFRS variable because the pre-IFRS period is at most 4 years (i.e. 2004 – 2007/8) and the post-IFRS is at least 6 years (i.e. 2007/8 – 2013). This naturally means that for the larger post-IFRS sub-sample relative to pre-IFRS the results that AWCA is lower for the postIFRS could be driven by higher power for the post-IFRS. The use of balanced data in particular minimizes any potential impacts of the new corporate governance code introduced by SEC in the latter part of 2010. To minimize such concerns, the three models are re-estimated using a balanced dataset [three years before the adoption year, 2007, (i.e. 2004-2006) and after 2007 (i.e. 2008 -2010)] for firms that were consistently listed on the GSE. This is consistent with Marra et al. (2011). The omission of the event year, 2007, is important since listed firms were given up to 2008 to complete switching to IFRS even though the country adopted the standards early 2007 resulting in a situation of having some firms reporting under IFRS in 2007 and others (late switchers) reporting using the local

standards in the same year. For a balance in sample therefore, the 2007 is ignored. This results in three periods before and three periods after 2007. The three post-IFRS periods up to 2010 helps to reduce the influence of the new governance code since the full effect is expected to occur after 2010. The rearrangement of data yields a reduced sample of 15 firms with each firm having six years observations leading to 90 firm year observations. The results of the RE estimation are presented in Appendix 4.

From Appendix 4, the figures do not reveal any serious variations between the results of RE estimation with abnormal working capital accrual based on balanced dataset and those results using unbalanced data. Except for the Column 3 of the Appendix 4, it is found as before that abnormal working capital accruals (lagged by total assets) decline significantly after IFRS adoption in Ghana. Both outside director measures are still positively associated with abnormal accruals but the relationships are not significant. Thus, the new corporate governance code does not affect the associations of the board measures and should not be able confound the findings. Other variables are qualitatively similar to the results obtained earlier suggesting that the results are less likely to be driven by confounding effects.

### 4.5.3 Measuring firm size by log of assets

In many studies carried out in the research field of earnings management such as Kothari et al. (2005), Marra et al. (2011) and González and García-Meca (2014), size is measured as the natural log term of year-end book value of total assets. Therefore, the study replaces the log of revenue variable with the log of total assets and rerun Models 1a, 1b and 2 to check whether the results are robust to alternative definition of size. The results are given in the Appendix 5.

From the Appendix 5, the results in all the three columns are almost identical with those in Table 4.5. The signs, magnitude and significance level of the estimated coefficients of both explanatory and control variables remain qualitatively the same as before. However, unlike log of revenue measure of size, log of assets measure does not stay consistently positive across estimations; it is positive only when outside director representation is measured by a continuous variable. In whatever case, the coefficient is insignificant all through.

### 4.5.4 Controlling for return on assets (ROA)

Various studies carried out on earnings management often control for performance since literature reveals that poor performance usually induces firms to manipulate earnings to hide true performance (e.g. Dechow et al. 1995; Klein, 2002; Dechow and Dichev, 2002; Kothari et al. 2005; Barua, Davidson, Rama and Thiruvadi, 2010). For this reason, the study has earlier on incorporated into the main models a loss dummy variable to separate good performers from bad ones since loss-making firm-years number up to a high level from the descriptive statistics in Table 4.2. 14% and 28% of the total sample size report losses a one year before during the pre-IFRS and post-IFRS adoption periods respectively. However, many of the cited studies measure their performance as ROA or some different measure which is very close to ROA. Consequently, in line with Marra et al. (2011), the study concurrently incorporates ROA and lagged loss year into the three models and the estimations are repeated. The new results are reported in Appendix 6.

From the observation of the new results in Appendix 6, it can be observed that it does not matter much whether performance via ROA is controlled for or not. The results before and after the introduction of ROA are qualitatively similar except that few variables lose significance in the estimations which hold ROA constant. The findings also indicate that the coefficients of determination take lower values when ROA is considered. The highest

overall $R^2$ obtained is 31.4% which falls a way below the lowest $R^2$ of 35.8% obtained when ROA is not incorporated (refer to Tables 4.5). Thus, it seems the model explains the dependent variable better without considering ROA in the main analysis. The estimated coefficients on ROA are not statistically significant at any level but are negative all through in line with expectation that high performers report lower abnormal accruals.

### 4.5.5 Controlling for cash flows from operations (CFO)

In line with Peasnell et al. (2005), Chambers and Payne (2011), Marra et al. (2011) and Prencipe and Bar-Yosef (2011), ROA is dropped for cash flows from operations (CFO) in control for any possibly systematic relationship that exists between cash flows and accruals to check the sensitivity of the main results. For instance, Chambers and Payne (2011) observe an inverse relationship between cash flows and accruals. Appendix 7 reports the regression results of all the models based on RE estimation after controlling for CFO effects.

The results reported show that the main results are not least immune to the effects of considering cash flows on abnormal accruals. However, it can be noticed that CFO improves upon the overall explanatory ability of the models as the overall $R^2$ goes up a little higher than $R^2$ obtained in the original estimations. The coefficient of CFO across estimations in Appendix 7 is a ―plus‖ sign (0.0247 in Column 1, 0.0402 in Column 2 and 0.0432 in Column 3) but not statistically significant in all the cases. The sign suggests that firms that generate more cash flows are associated with higher abnormal accruals and lower earnings quality. The sign is against expectation because higher CFO usually results in lower accruals (Dichev and Dechow, 2002).

### 4.5.6 Results of FE estimation of Models 1a, 1b and 2

As argued by Greene (2003), fixed effects estimators hold constant any unobserved within unit effects in order to control for or reduce any possible endogeneity in models. Violation of the assumption of exogeneity in OLS-related models causes serious bias in the results obtained from their estimations. According to Liu and Lu (2007) and Brown et al. (2011), the issue of endogeneity is a common econometric problem in corporate governance studies. In addressing this problem, Liu and Lu (2007) suggest that the use of both RE and FE estimations rather than cross-sectional pooled regression helps reduce the problem and further assert the FE addresses the problem better. Inspired by their argument, the author reruns the results of all the three models using FE estimator (specifically by applying the ―*xtreg…fe*‖ command in Stata 13.1). The results are presented in the Appendix 8.

It should be noted from Appendix 8 that after controlling for the within firm effects the results originally obtained do not change so much. Estimated coefficients of all the main variables still carry their original signs except that *CONTR* variable sacrifices a good proportion of its statistical significance increasing the level from 1% to 10% level and that both *OUTDIR_DOM* and *NODUAL* are significantly and positively associated with poor quality in all the estimations. Since the FE and RE estimations produce almost the same results it does seem that endogeneity is likely to be less of an issue in this study. Along with the FE estimations and the balanced dataset results, controlling shareholder variable which by itself constrains abnormal accruals, on average, has slightly changed between pre- and post-IFRS periods suggesting that the negative impact of the accounting changes is more likely to be driven by IFRS adoption rather than by other factors.

**4.5.7 Different types of controlling shareholder**

The study splits controlling shareholding (*CONTR*) into three types: a) state controlling shareholding (*STCONTR*); b) foreign investor controlling shareholding (*FCONTR*); and c) locally private controlling shareholding – families, individuals and institutions – (*LCONTR*). This partitioning is so made in an attempt to find out whether there are discriminations in the impacts of a controlling shareholder on earnings management. The disaggregation follows the discussion made by Tsamenyi et al. (2007) and Greif (2012) that the three forms of ownership are the typical concentrated ownerships present among Ghanaian listed firms. In line with Greif (2012) state controlling shareholding is measured by the sum of the holdings by government, its ministries and departments, SSNIT and CocoBod. Controlling ownership becomes foreign if the shareholder in question is multinational. For instance, the parent of Fan Milk, based overseas, holds more than 50% throughout the ten year period and clearly, this parent is a foreigner. Using Models 1a and 1b, the study reports results that show the differential impacts of different types of controlling shareholder in a table under Appendix 9. Appendix 9 is a table consisting of six columns; Columns 1-3 report results of RE estimation of Model 1a for the different ownership types, considering each one at a time in line with Palmberg (2012) and González and García-Meca (2014) while Columns 4-6 report results of Model 1b for the different ownership types considering each one at a time

The results as set out in Columns 1-6 of Appendix 9 imply that none of the three controlling shareholder types constrains management's efforts to manage earnings apart from locally private owners. The signs attached to the coefficients of each of the ownership types remain negative in both Models 1a and 1b but only statistically significant (at 1% significance level) with LCONTR suggesting that both state and multinational controlling shareholders are ineffective in monitoring their firms to the benefits of all stakeholders. The results indicate

that the estimated coefficient on *LCONTR* is the largest (that is, coefficients of -0.0795 and -0.0896 in Models 1a and 1b respectively as against -0.0474 and -0.0446 for *STCONTR* and -0.0202 and -0.0469 for *FCONTR*) indicating that local investors who own majority shareholding are most likely to suppress manipulation of earnings in terms of the magnitude among the three forms of ownership. The results for the other variables are qualitatively similar to those before.

### 4.5.8 Alternative measure of abnormal accruals

Given that earnings management is an elusive concept, measuring earnings management using a single measure, abnormal working capital accruals (scaled by total assets) may be insufficient. But with regards to the constraints under which the study is carried out the various tests such as the use of finite sample size, caution is exercised to alternatively measure abnormal accruals so that the original discussions justifying the use of abnormal working capital accruals are not contradicted. Hence, the study considers as an alternative measure, the abnormal working capital accruals scaled by revenue in line with Prencipe and Bar-Yosef (2011) rather than by total assets as in Marra et al. (2011) to find out whether the main results are robust to alternative measurement of the dependent variable.

The results obtained using the new measure of abnormal accruals are reported in Appendix 10. The regression results presented in this appendix do not vary so much from the results of the main measure of the dependent variable reported in Tables 4.5 and 4.6. In particular, the results of Models 1a and 1b as presented in Columns 1 and 2 respectively in Appendix 8 show that coefficients of both IFRS and CONTR are still statistically significant and negative (with significance levels of 1% and 5% respectively in both models) indicating that the move from GNAS to IFRS and controlling shareholding in firms help constrain earnings management. Hence, Hypotheses 1 and 2 are still supported when a different measure of

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abnormal accruals is employed. The direction and significance of the coefficients of NODUAL have not changed. The results strengthen the earlier ones that role separation between CEO and board chairperson has a significant and positive association with abnormal working capital accruals (with a significant level of 5% in both models). A different story however exists for outside direction representation on the board.

It is found that both continuous and dichotomous measures of board composition are not significant and show different signs. All the interaction terms are still not significant suggesting that standards alone matter more than firm incentives in at least Ghana. Control variables are practically the same in terms of signs, significance and magnitude of coefficient estimates.

Overall, the results of the alternative measure are similar to those obtained for the main measure. Table 4.6 next summarizes the test results obtained from the univariate, bivariate (correlation) and multivariate (RE estimation) analyses for all the hypotheses stated in chapter three and the control variables incorporated into the mainstream multivariate analysis models in a tabular form as follows:

**Table 4.6 Summary of test results with expected signs and actual signs**

| | Expected Sign | Results | | |
|---|---|---|---|---|
| | | Univariate | Bivariate | Multivariate (RE results) |
| **Main variables** | | | | |
| IFRS adoption | - | S (-) | S (-) | S (-) |
| Controlling shareholding | +/- | NS | NS | S (-) |
| Proportion of outside board representation | +/- | NA | NS | NS |
| Outside dominated board | +/- | S (+) | PS (+) | S (+) |
| Separation of CEO's role from the board chairperson's role | +/- | NS | NS | S (+) |

| | | | | |
|---|---|---|---|---|
| Interaction between IFRS adoption and controlling shareholding | +/- | NS | NS | NS |
| Interaction between IFRS adoption and outside dominated board | +/- | NS | NS | PS |
| Interaction between IFRS adoption and separation of CEO's role from the board chairperson's role | +/- | NS | NS | NS |
| **Controls** | | | | |
| Holdings of the top 1 shareholder | + | NA | S (+) | S (+) |
| Board size | +/- | NA | NS | NS |
| Growth | + | NA | S (+) | S (+) |
| Leverage | +/- +/- | NA | NS | NS |
| Size | - | S (+) | S (+) | S (+) |
| Audit quality | | NA | S (-) | S (-) |
| Loss firms one year before | + | NA | S (+) | S (+) |

*Where S = supported; NS = Not supported; PS = Partially supported; NA = Not applicable*

**4.6 Discussion of main findings**

As indicated in Chapter 1, the study seeks to determine whether IFRS adoption has had any impact on earnings quality among the sampled firms, whether and how controlling shareholding and outside directorship individually relate to earnings quality and whether and how IFRS adoption interacts with controlling shareholding and outside directorship to affect earnings quality. The findings for addressing these issues were reported in Sections 4.3 through to 4.5 (as summarized in Table 4.7 above) and are discussed in turn.

### 4.6.1 The impact of IFRS adoption on earnings quality

The findings indicate that the adoption of IFRS has had positive impact on the quality of reported earnings by reducing the level of abnormal accruals among the sampled firms. Table 4.7 shows that the validity of Hypothesis 1 is supported by the results of univariate, bivariate and multivariate analyses. This potentially confirms the notion that the quality of accounting standards affects the quality of information disclosed in the financial statements and that firms that report under IAS have higher earnings quality (Ashbaugh and Pincus, 2001; Barth et al., 2008; Chen et al., 2010). Hence, the findings provide support to the transparency hypothesis. Such results quickly rule out the expressed concern of many who harbor the belief that Western-based accounting standards do not address the exact needs of developing economies and hence, have nothing or very little, if any at all, to offer in terms of real benefit to these economies (e.g. Mir and Rahaman, 2005).

The results are in line with those found in other emerging countries such as Kenya by Bova and Pereira (2012) and Malaysia by Ismail et al. (2013). These results also are possibly in synchrony with those reported by Cai et al., (2014) whose cross-country study reveals that firms operating in countries where divergence between local GAAP and IFRS is wide are associated with reduced magnitude of accruals and income smoothing. The results also offer support to those reported by Ding et al., (2007) who discover that firms which are based in regions where the level of absence of equivalent IAS is pronounced are gifted with improved earnings quality. Thus, the reduced earnings management is likely to have resulted because IFRS have corrected several deficiencies and absence of wider coverage that plagued the hitherto local GAAP, GNAS, as documented by Assenso-Okofo

et al. (2011).

However, the results draw a sharp contrast with those reported from an Egyptian setting by Elbannan (2011) who finds no discernible reduction in earnings management or apparent improvement in value relevance of accounting information post-IAS convergence. This may be due to the fact that the IAS adoption of Egypt was not wholesale as Ghana's, hence, making not so much improvement in the Egyptian accounting regulation. Again, the study findings contend with a recent study in Ghana by Bokpin (2013). He reports that disclosure level does not improve much after the adoption of IFRS and concludes to some extent that the switch has not affected financial statements much. The difference in results may be due to at least two differences in methodologies. First, dependent variables are not the same; while his study focuses on level of disclosure this study focuses on earnings management, a more specific quality measure. Firms are likely to pay more attention to the actual figures (earnings) than the footnotes (Hirshleifer and Teoh, 2003). Second, Bokpin (2013) considers a period up to 2008 while this study extends the test period six years after the adoption up to 2013; perhaps firms may need more time before understanding the application of IFRS accounting provisions. The study results do not notably concur with Ball et al. (2003) who conclude that IASB standards alone are not enough to result in the expected benefits associated with IFRS after they document no impact of IAS adoption in East Asia. The results therefore defy the theoretical argument that standards alone cannot produce the intended benefits if the reporting incentive is not strong in a setting.

Overall, the above discussion possibly lends support to the appropriateness of institutional structure argument, specifically with respect to divergence between local GAAP and IFRS, as theoretical basis when attempting to examine the effects of IFRS adoption.

**4.6.2 Association of controlling shareholding with earnings quality**

The findings indicate that there is a significant inverse (positive) association between controlling shareholding and earnings management (earnings quality). This suggests that controlling shareholders are active monitors rather than champions of expropriation and that their presence reduces the Type I agency conflict in line with agency theory. The findings lend support to the claims by Harris and Raviv (2008) that insider control is better than outsider control by non-executive directors and external auditors. The possible explanations attributable to this outcome are set out below.

First, the results fit well into the argument that the existence of controlling ownership helps to overcome manager-owner rift because large owners often have the information advantage, resources, ability and incentive to monitor management better than dispersed shareholders (Jensen and Meckling, 1976; Shleifer and Vishny, 1997). In fact, Berle and Means (1932) in their seminal paper do indicate that the genesis of the conventional agency problem is divergence between managing and financing and even more so, when the shares of the firm are widely held. This lack of concentration stifles the ability and the motivation of many of these owners especially those with miniscule financial interest. Small shareholders typically resolve to turn into free-rider beneficiaries of the monitoring efforts of few active others (owners). As concentration of shares occurs, free-riding diminishes and this accords with the position of Renneboog (2000) who argues that the problem of free-riding becomes less of an issue in the wake of emergence of large shareholders. LaPorta et al. (1999) submit that controlling shareholding tends to be an effective monitoring tool in the absence of strong investor protection provisions and practices.

Second, for reputation-building reasons, controlling shareholders usually try to ensure transparency in order to send credible signal that they are committed to the firm and keep

the interest of small shareholders in check (Gomes, 2000; Ding et al., 2007). This means that by ensuring that financial information is of high quality controlling shareholders are able to counter the notion that their presence in the firm results in extraction of firm's wealth to the disfavor of small shareholders; consequently, this aids to avoid any probable price discounting by the small shareholders who share the notion.

Third and final, as argued for alignment of interest hypothesis, in cases where the cash flow rights and voting rights are high, controlling shareholders hold a little motivation to expropriate wealth from the firm as the cost of such actions may outweigh the benefits (Fan and Wong, 2002). This is particularly the case where ownership concentration does not build up through pyramids leading to less divergence between voting rights and cash flow rights. Further, monitoring management's actions is likely to be less costly for large shareholders relative to small shareholders as a monitor foots all the costs associated with his or her control efforts but only benefits in proportion to his or her holding (Demsetz, 1983).

Various controlling shareholding types have been pointed out to include state controlling ownership, foreign investor controlling ownership and locally private (including families, private institutions and individuals) controlling ownership (see Tsamenyi et al. 2007). To this end, the study has reported the results of the individual effects of these different types of ownerships under Section 4.5. After the partitioning, it is observed that only the locally private controlling ownership results in reduced earnings management suggesting that it does matter who the controlling shareholder is if minority shareholders are concerned about having their interest served. The results are explained in turn.

First, the findings that it is only the locally private controlling shareholders who are able to push management to the walls to cause them to report the true state of affairs can be traced to the nature of the background of these investors. An inference made of the literature review

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of Greif (2012) that corporate ownership is likely to be dominated by the state, multinationals and others might indicate that the ―others‖ should be the local institutions, individuals and families. The author deduces the representation of the others from the argument made by Mensah (2002) and furthered by Tsamenyi et al. (2007) that African countries typically have institutional and large shareholders made up of the state and rich families and local institutions. Families and large institutions often have long-term orientation towards the firm growth and survival (Fan and Wong, 2006) and hence, have less incentive to manage earnings to tap short-term benefits at a cost of long-term disturbances such as minority shareholders offering to pay less for the firm‘s shares (Gomes, 2000). Second, the nil relationship between the state ownership and abnormal accruals reflects the possibility that the desire of government officials to hide the effects of probable inefficiencies, embezzlements and other corrupt doings (Mensah, 2002; Ding et al., 2007) are offset by the ‗natural‘ muteness of state-owned enterprises to market pressures to manipulate earnings (Wang and Yung, 2011). Third, the nil influence of foreign controllers on earnings quality may be as a result of foreign parent companies‘ tunneling activities through spurious and ―uncommercial‖ related party transactions among group members (Kim, 2012) being netted off against the desire of these shareholders to demand transparent reports (Covrig, Defond and Hung, 2007; Bova and Pereira, 2012; Lin, 2012; Fang, Maffett and Zhang, 2015).

However, the results are inconsistent with the belief that controlling shareholding causes large shareholders to turn into large empire builders which drive them to engage in certain activities that are detrimental to small shareholders (Stulz, 1988; Shleifer, 1989; Leuz et al. 2003). As a result, controlling shareholders tend to connive with management to produce accounting information that helps to keep their ―evil deeds‖ in secret. For instance, Chen and Zhang (2014) report that earnings are managed more in those firms with controlling

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shareholders than in firms without controlling shareholders while Fan and Wong (2002) show that concentrated owners cause their firms to report less informative earnings information in order to hide the proprietary information of the firms' rent-seeking activities.

From the above, it has become apparently clear as to why agency theory and monitoring versus expropriation hypothesis can be used as theoretical basis to examine the role of controlling shareholding in the financial reporting process.

### 4.6.3 Association of outside directorship with earnings quality

The two measures of outside directorship are considered. These consist of: a) proportion of outside directors on the company board and b) separation between the roles of the CEO and board chairperson.

**Proportion of outside directors**

The results suggest that there is no significant relationship between the proportion of outside board members and abnormal accruals. Worse, it is found that when there is high (at 25%, 50% and 75%) proportion of outside directors in the firm a positive (negative) relationship between outside director representation and abnormal accruals (earnings quality) emerges. The results conform to the argument by Fan and Wong (2005) who allege that ordinary control mechanisms such as board and takeover controls are ineffective in regions with many firms with concentrated shareholding. These outcomes are identical to Ghanaian findings obtained by Ogeh Fiador (2013) who reports no significant relationship between board composition and value relevance of information.

The results are also in line with Italian findings obtained by Prencipe and Bar-Yosef (2011) who report that board independence becomes mute to monitor managers of familycontrolled firms. It is important to understand these matters in the light of the revelation by Armstrong

et al. (2010) that for effective monitoring from outside directors to occur it demands that the directors possess the necessary skill and knowledge and are validly independent of the CEO (Bushman, Piotroski and Smith, 2004). Therefore, the possible explanations to the findings offered include the following.

First, outside directors may be ill-informed about the affairs of the company especially where they have entrenched management team to handle (Armstrong et al., 2012). Naturally, management and inside directors possess much more information than outside directors (Raheja, 2005) and are often reluctant to let out to the outside directors any information that might lead to create a bad impression regarding the performance and efforts of insiders (Verrecchia, 2001). Information asymmetry between managers and outsiders may be largely driven by higher information acquisition and processing costs most especially if the firm in question is very complex in terms of its natural transactions and growth pattern as posited by Armstrong et al. (2010). They argue that it is unsurprising to find outside directors not performing up to expectation in the wake of informational disadvantage of these monitors since they necessarily require right and sufficient information with which they can fulfill their monitoring role. Armstrong et al. (2010) strongly advise that outside directors only have any hope to perform their monitoring role effectively if the firms to which they attached are committed to information transparency and disclosure, the lack of which is expected to lead to malfunctioning of the outside directors. In these circumstances, the outside directors cannot be anything less than ineffective in carrying through the routines of their roles as monitors. Cai, Liu and Qian (2009) assert that it is not necessarily right for every firm to have higher number of outside director proportion as the what makes up the appropriate composition is anchored on the individuality of issues affecting and surrounding the particular firm in question.

Second, the passiveness in their posture as monitors may also stem from the fact that in the wake of protruding concentration of shareholding, the increased outside director representation becomes a natural occurrence. This is because large shareholders (who think they can monitor and have incentive to do so) usually have intention to reduce freerider problem by scaling down the number of executive directors and replacing them with the outside directors. In a truer sense, a firm may engage outside directors mimetically in order to keep up with the expectation of the society and regulators rather using these nonexecutives for monitoring purposes (Renneboog, 2000).

Third, the ownership stake of outside directors is small in Ghana (Mensah, 2002). As argued by Jensen (1983), non-executive directors are like executive directors who become interested in protecting the interest of other shareholders only when they have ownership interest in the firm. Hahn and Lasfer (2011) have in offer that inappropriately specified compensation schemes often begs the output of lackadaisical monitoring from nonexecutive directors. The situation could degenerate to a level where these directors are now in connivance with managers to defraud and when coupled with their inactivity might cause manipulation to precede supply of accounting information to an extent that the information turns into poison in a honey bowl.

Fourth, non-executive directors are probably clothed in the colour of the large shareholders. Kyeampong (2014) alleges that in Ghana, many directors are sent to sit on boards on the account of their affiliation to the owner and on the basis of expediency rather than competence. This background rolls out doubts therefore as to whether nonexecutive directors are truly and sufficiently independent and competent to monitor effectively the actions of management. Under these circumstances, all directors are more functional in

aiding in making strategic decisions rather than assisting to clamp down on agency costs created by self-serving managers' misconduct.

The findings however contrast with those of several authors including among others Dechow et al. (1996), Xie et al. (2003), Davidson et al. (2005), Jaggi, Leung and Gul (2009), Marra et al. (2011), Taktak and Mbarki (2014) and Chen and Zhang (2014). The variation in results could be assigned a reason that these studies were carried out in regions where share ownership is probably more dispersed and strong corporate governance regulation and enforcements exist.

**Separation between CEO's and chairperson's roles**

Results indicate that firms with non-CEO chairperson are positively (negatively) associated with abnormal accruals (earnings quality). These results suggest that a Western governance style of making the CEO less powerful in firms does not necessarily translate into improved accounting information quality in an environment where ownership concentration is high. As if the results seem too odd to have precedents, not too distant away, the results are not out of line with findings of Ogeh Fiador (2013) who fails to obtain strong evidence that separation of CEO's role from chairperson's leads to favourable market response. However, on rare occasions that evidence was obtained, she observes negative impact of role separation on value relevance of earnings and net assets. In a more distant setting, Hong Kong, Lam and Lee (2008) also document similar findings that firms with CEO duality are significantly and positively associated with better financial results. The following reasons may account for the results.

First, non-CEO chairpersons are likely to be offering their services to firms that have dominant shareholders (Agyemang and Castellini, 2015). Agyemang and Castellini point out that the appointment of CEOs and directors (including the chairpersons) among listed

firms on the GSE is almost totally a prerogative of these large shareholders indicating that the two powerful corporate officials are likely to be friends thus, making monitoring difficult. This is in concordance with Jaggi and Leung (2007) and Jaggi et al. (2009) who all find independence of chairperson in family-controlled firms to manifest only in form but not in substance. In this case, the substitution effect takes place in that the controlling shareholder being an insider and having more incentive takes over the monitoring role from the so called independent chairperson. The decision to separate the roles then occurs because the market and regulations solicit for that rather than the split ensuring that the CEO is monitored (Renneboog, 2000).

Second, an argument reigns that it is not always wrong to have the roles of the CEO and board chairperson combined into a single hand. To this end, Brickley, Coles and Linck (1999) argue that because CEOs are often well positioned and do have firm-specific information relative to outsiders, firms with information asymmetry might fare better in terms of proper monitoring with a CEO doubling as the chairperson. This gives the notion that where the non-CEO chairperson is less likely to access more and quality information, monitoring the efforts of the CEO including the financial reporting activities of the firm by this outsider is least likely to be effective. Hence, the separation might not have turned into the expected results of improved earnings quality via reduced abnormal accruals but actually increased abnormal accruals perhaps because the chairperson being one of the outside directors might have been disadvantaged by having insufficient information.

Third, the decreased earnings quality may be due to the CEOs growing up their bargaining power to a significant level that they have succeeded in attaining the loyalty votes of their monitors, the chairpersons (Hermalin and Weisbach, 1998). This is normally the situation if CEOs have history of good performance and unique abilities. In this instance, no effective

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monitoring can be offered by the chairperson as their earlier possible friendship might soar up.

The results presented, however, are in contrast with Farrell et al. (2013) who report that non-duality leads to improved reporting quality because the shared power allows the independent chairman who is distinct and separate from the CEO to challenge any questionable behaviors of the latter. Marra et al. (2011) also have disagreeing results. The differences in the context of the studies may account for the variations in findings.

The above discussion may raise question about the appropriateness of agency theory as a theoretical basis for looking into the effects of outside directors and CEO/chair separation on earnings quality and other financial reporting outcomes in at least Ghana.

Generally, the author observes that shareholder control through controlling shareholder is more effective than board control through outside directors and non-CEO board chair. This refutes the reservation shared by Agyemang and Castellini (2015) that concentrated shareholders are likely to be more entrenched in their firms given that these shareholders dominate key decisions that firms take. Does perceived improvement in information environment occasioned by IFRS adoption improve the monitoring value of controlling shareholders or reduce the ineffectiveness of outside directors? These issues are considered next.

### 4.6.4 Association of controlling shareholding and outside directorship with earnings quality via earnings management after IFRS adoption

The results generally suggest that there is no marginal effect on abnormal accruals for firms with controlling shareholders, firms with more outside directors and non-CEO chairpersons following the adoption of IFRS in Ghana. From Table 4.7, it can be observed that none of

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the interaction terms incorporated into Model 2 is statistically significant and thus obtains no support for the related hypotheses. The results confirm that firm-level incentive plays virtually no role when looking into the effects of IFRS adoption among at least listed firms in Ghana indicating that standards alone are sufficient to cause the predicted outcome of increased transparency and informativeness of reports. This is inconsistent with findings by Ball et al. (2003) and Daske et al. (2013) who suggest that different firms even in the same country are affected differently by changes in accounting standards. At very high outsider proportion of 88% (75th percentile cut-off point) however, firms, on average, experience incremental reduction in abnormal accruals. The results are explained below.

For controlling shareholding, it has been found that its constraining ability is largely driven by locally-based private controlling ownership but not the state or foreign ownership. Since it is the locally private investor's net positive reporting incentive that ultimately drives up the constraining power of controlling shareholding, it does not look unexpected if this variable does not obtain any incremental benefit. Well, it is typical that local investors are not likely to possess any more knowledge of IFRS and reporting incentive in complying with IFRS than others (Bova and Pereira, 2012). This means that the gap between controlled firms and non-controlled firms with respect to financial reporting quality does not widen up any further after the change in accounting regulation in Ghana. Thus, firms without controlling shareholders are as just less effective in stimulating quality reporting after the change to IFRS as before the change.

For outside directorship, it has been shown that it does not reduce abnormal accruals. Both role separation and proportion of outside directors fail to improve post-IFRS adoption in terms of their monitoring value to the firm. This indicates that even though IFRS help to reduce earnings management it does not equally do any magic by causing ineffective board

monitors to become effective. Conversely, the findings may indicate that it is not because of weak accounting regulations per se that cause board monitors to malfunction in fulfilling their monitoring responsibility. However, it must be acknowledged that a good look at the results of Model 2 of Table 4.5 reveal that the sign on the coefficient of the interaction between *IFRS* and *OUTDIR_DOM* is a minus implying an insignificantly negative marginal effects. It does seem that firms with very high outside dominated board experience significant marginal reduction in abnormal accruals after IFRS adoption. A look at Appendix 3 shows that if a firm has at least 88% (75th percentile mark) proportion of the total board size as outsiders, then outsiders become less ineffective in constraining earnings management. Specifically, a firm with at least 88% outside director

representation is associated with reduced positive coefficient of 0.034 (i.e. 0.141 – 0.101) after IFRS adoption from 0.141 in the pre-adoption era. This marries with the belief that outsiders monitor best when they have more transparent information (Armstrong et al., 2010). This agrees with the findings obtained by Marra et al. (2011) who find both proportion of outside directors and CEO non-duality becoming more effective after Italian firms switched to IFRS in 2005 as part of the move that saw the European Union adopting IFRS.

The implication of the above discussion is that concerns are raised about the appropriateness of basing IFRS firm-level effects study in at least Ghana on the theoretical grounds of reporting incentive hypothesis. However, little support is offered.

## 4.7 Other discussions

In this section, brief insights are offered into the findings obtained for the primary controls which include the holding of the top one shareholder, board size, leverage, growth, firm size, bad performance (loss in prior year) and audit quality.

The shareholding of top one shareholder has a positive (negative) association with abnormal accruals (earnings quality). This conforms to the findings obtained by Ding et al. (2007) that higher ownership concentration incrementally leads to dominant owner entrenchment and increased discretionary accruals. However, the results contrast with alignment notion that ownership concentration leads to a reduction in agency conflicts because of the reduced dispersion of share holdings (Shleifer and Vishny, 1997). Board size has no association with abnormal accruals suggesting that the resource advantage and diversity benefits (Ghosh et al., 2010) are likely neutralized by the potential disagreements and free-riding that can be associated with large board size (Armstrong et al., 2010). No significant association is found for leverage contrary to expectation though as large use of debt funding in Ghana (Assenso-Okofo et al., 2011) should have caused firms to become prone to manage earnings to meet covenant terms (Sweeney, 1994; Park and Shin, 2004). Growth is significantly and positively associated with abnormal accruals. This is in line with the belief that growing firms tend to be more active and are likely to have larger abnormal accruals than start-offs and matured firms (Becker, DeFond, Jiambalvo and Subramanyam, 1998). Firm size is strongly and positively associated with abnormal accruals implying that larger firms are likely to manage their earnings more than smaller firms. This is consistent with Xie et al. (2003) and Lobo and Zhou (2006) who find that larger firms are less transparent. Firms that reported losses one year before the current year tend to manage earnings more as the results show a positive association between loss dummy and abnormal working capital accruals. This confirms the belief of DeGeorge et al. (1999) and Marra et al. (2011) that firms with bad past years tend to rectify bad trend by manipulating their current earnings. Finally, the results indicate that audit quality suppresses earnings management. This is in line with expectation that larger audit firms are more resourceful in terms of personnel and

reputational capital to allow them offer quality service and such agrees with the findings of Fan and Wong (2005).

**4.8 Chapter summary**

This chapter has presented the results of various analyses meant to enable the study test its hypotheses. Specifically, the chapter has reported the descriptive statistics of all the variables, univariate analysis of the dependent variable, correlation (bivariate) analysis, the results of data and regression diagnostics and the multivariate analysis including various sensitivity and robustness checks. The findings for all the main and control variables obtained from these analyses have been discussed. Chapter five follows next with summary of the findings, conclusion and recommendations.

# CHAPTER FIVE

# SUMMARY, RECOMMENDATION AND CONCLUSION

## 5.0 Introduction

Chapter one discussed the general introduction by highlighting the research problem and the research objectives of this study. The main question of whether and how controlling shareholding, outside directorship and IFRS adoption affect earnings quality was emphasized. Chapter two provided the reviews of prior works and the theories applied which ultimately are used to develop the study's conceptual framework. Chapter three presented the research methodology to address the research objectives. Chapter four reported and discussed the findings. This chapter focuses on providing the summary of all key findings, conclusion of the whole study and the recommendations based on the findings.

The rest of the chapter proceeds as follows: Section 5.1 gives the summary of the findings. Section 5.2 presents out the overall conclusion of the study. Section 5.3 provides recommendations that cover suggestions for policy consideration and future research. Key limitations faced in the study basically underscore the suggestions made for further studies.

## 5.1 Summary of findings

In this section, the author summarizes all the key findings obtained to fulfill each of all the research objectives in chapter one as below.

**5.1.1 Impact of IFRS on earnings quality**

The first objective pursued in this study is find out whether the move from GNAS to IFRS has had any impacts on earnings quality among the sampled firms. In relation to this objective, the study first hypothesizes that ceteris paribus, IFRS adoption has a positive association with earnings quality. The results indicate that the adoption of IFRS has significantly and positively affected earnings quality thus, lending support to Hypothesis 1. In particular, the results show that after the move to IFRS, the sampled firms on average have experienced significant reduction in the level of the absolute value of abnormal working capital accruals suggesting that firms do manage earnings less in the postadoption period than in the pre-adoption period. The findings provide confirmation to the transparency hypothesis that IFRS are more quality standards that enable the production of more transparent and useful accounting information to users of the information.

**5.1.2 Association of controlling shareholding with earnings quality**

The second research objective pursued in this study is to find out whether and how controlling shareholding is associated with earnings quality. In relation to this objective, the study provides the second hypothesis that ceteris paribus, there is an association between controlling shareholding and earnings quality. The results indicate that there is a significant and positive association between controlling shareholding and earnings quality among the sampled firms thus, lending support to Hypothesis 2. In particular, the results show that controlled firms on average are significantly associated with lower level of absolute value of abnormal working capital accruals suggesting that controlling shareholders are able to and do monitor management by constraining earnings management among the sampled firms. The results further reveal that this monitoring value is particularly associated with

those firms which are controlled by locally private investors such as local institutions, families and individuals. Overall the findings show that controlling shareholders in listed firms do monitor rather expropriate their firms.

### 5.1.3 Association of outside directorship with earnings quality

The third objective pursued in this study is to find out whether and how outside directorship is associated with earnings quality. In relation to this objective, the study presents that third hypothesis that ceteris paribus, there is an association between outside directors and earnings quality. Results are obtained for two different measures of outside directorship including a) proportion of outside directors on the company board; and b) CEO non-duality. For the proportion of outside directors, on one dimension, where this measure is defined in continuous term the results indicate that there is no or statistically weak association between outside directors and earnings quality thus, lending no support to Hypothesis 3a. On another dimension, where the measure is defined using a binary variable to partition the sample into firms with outside dominated board and those with inside dominated board the results indicate that firms with outside dominated board are significantly associated with higher level of unexpected working capital accruals. Thus, support is lent to Hypothesis 3a. Put together, outside directors generally do not reduce or increase earnings quality however, as the proportion of these directors exceeds a certain cut-off point (50th percentile in this case with a corresponding proportion of 86%) firms on average experience decline in earnings quality through increased level of absolute value of abnormal working capital accruals. Again, after changing the cut-off point from 50th to 25th and 75th percentile points it is found that firms with proportions falling within the upper 75th and 25th percentiles respectively do not and do report lower earnings quality through higher abnormal accruals. For CEO non-duality, the results show that firms with role separation are associated with lower earnings

quality through higher abnormal working capital accruals thus, lending support to Hypothesis 3b even though the direction is unexpected. On the whole, the results contribute to the debate that the appropriateness and effectiveness of corporate governance measures depends on the context.

## 5.1.4 Association of controlling shareholding and outside directorship after IFRS adoption

The final objective pursued in this study is to find out whether and how controlling shareholding and outside directorship are associated with earnings quality after IFRS adoption. In relation to this objective, the study gives the fourth and final hypothesis that all other things held constant, the association between controlling shareholding and outside directorship and earnings quality differs between pre- and post-adoption of IFRS. In chapter three, this hypothesis is divided into three sub-propositions (a, b and c). Hypothesis 4a relates to the association of controlling shareholding with earnings quality post-IFRS while 4b and c relate to the associations of proportion of outside directors and CEO/chair split with earnings quality post-IFRS. The results indicate that controlled firms do not become better off or worse off after IFRS adoption as the findings show no marginal effects attributable to controlled firms by switching to report under IFRS. Outside boards and non-CEO chairpersons are generally not associated with any incremental effects following the adoption of IFRS by their firms. But at very high level of outside director domination (specifically 88% at least), firms on average experience significant and incremental improvement in earnings quality through reduced abnormal working capital accruals. The evidence suggests firms with very high proportion of outside directors experience higher reduction in earnings management associated with IFRS adoption. Thus, partial support is garnered for Hypothesis 4b but no support is found for 4a and 4c. The results also show that

firm-level incentives to a low extent may be important when looking into the effects of IFRS adoption in at least Ghana.

## 5.2 Conclusion

Both empirical and theoretical evidence is prevalent that not all externally reported earnings are a true reflection of the underlying performance of an entity. This suggests that some earnings may lack quality and the level of quality (the lack of it) may intuitively differ across firms. Unfortunately, very little is known about this issue in Ghana. From the theoretical angles of transparency, reporting incentive, agency and monitoring-versusexpropriation arguments, this study looks into this issue by examining the association of controlling shareholding, outside directorship and change in accounting standards from

GNAS to IFRS with the level of earnings quality among sampled listed firms in Ghana. The study also considers whether and how the association of controlling shareholding and outside directorship changes after the introduction of IFRS. Four main hypotheses emerge and are tested in this study.

By representing higher earnings quality in lower earnings management and using abnormal working capital accruals as a measure of earnings management, the study attempts to gather evidence to address the issue by applying panel-based RE estimation and augmented pooled OLS estimation. These are supplemented by FE estimations. The study finds that the expected associations of IFRS adoption, controlling shareholding, outside board representation and CEO non-duality with earnings quality. Particularly, the results suggest that IFRS adoption has a significant and negative (positive) association with the level of absolute value of abnormal working capital accruals (earnings quality) suggesting IFRS adoption improves the quality of reported earnings. The study also finds that firms with controlling shareholders are significantly and negatively (positively) associated with lower

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level of absolute value of abnormal working capital accruals (higher earnings quality) suggesting that controlling shareholding is an effective disciplinary tool. Further analysis is carried out into this association after partitioning controlling shareholding into three types including state, multinational and locally-based nongovernment related shareholding. The results of this extended analysis indicate that only locally private controlling shareholding seems to monitor effectively the financial reporting process; both state and foreign investor controlling shareholders are not likely to constrain earnings management among listed firms in Ghana. Again, the evidence indicates that overall outside directors do not seem to make any difference between firms which manage more and those which manage less but if they do, they rather fuel up earnings management by associating more with those who exhibit more earnings management. Moreover, it counts for more opacity in information to have the roles of CEO and board chair separated as the findings suggest that firms which have not combined the two roles tend to be associated with higher level of absolute value of abnormal working capital accruals (lower level of earnings quality).

To test whether and how the influence of IFRS adoption on earnings quality affects or is affected by the presence of controlling owners and outside directors, the study employs a different model that incorporates three interactive terms between IFRS and controlling shareholding, proportion of outside directors and CEO/Chair separation. The results of this model indicate that IFRS adoption does not necessarily map down into enabling controlling shareholders or outside directors to become more or less effective in reducing earnings management. However, the study reports that post-IFRS marginal gains only occur when the proportion of outside directors falls within the upper 25th percentile. Correspondingly, the minimum of such proportions is 88%. The results of series of additional analysis suggest that the results are not vulnerable to different specifications, different measures of dependent variable and some independent variables, different design and more controls.

The study makes several contributions to knowledge. Notably, the study is the first or one of the few to look into the effects of major revision in Ghana's accounting regulations since 2007. The study confirms the notion that where there is wide divergence between the local GAAP and the IFRS, the IFRS-based earnings often tend to be of higher quality. Again, the results of the study provide quantitative evidence that shareholder control is better in monitoring the financial reporting process than the Western-based board control conforming to the argument that outside directors in concentrated firms are less effective. Hence, the insistence that firms should definitely follow almost every Western-based governance practice is likely to be cost ineffective for complying firms.

The author makes several recommendations that count for policy considerations. Areas for further studies are also suggested to perhaps aid in overcoming limitations of this study. These are discussed next.

## 5.3 Recommendations

In this section, the author suggests various measures on the basis of the findings obtained that should be considered by policy makers and also recommends areas requiring further research.  These two broad dimensions are detailed out as follows.

### 5.3.1 Recommendations for policy considerations

For policy considerations, the following recommendations are made around the IFRS implementation and compliance in Ghana, firm ownership and outside directorship.

First, to the **stock market regulator**, the author recommends that it puts in place measures to deter poor reporting. Given the high earnings management posture of the sampled listed firms concerns are raised about whether the stock market is able to function effectively

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without trustworthy information. It is therefore not surprising to find the information disclosed in the financial statements to lack value relevance (see Bokpin, 2013). Ogeh Fiador (2013) also reports that earnings per share do not have any bearing on market prices of equity of firms listed on the GSE. Without quality information, the proper functioning of stock market becomes questionable. Therefore, the regulators of the GSE should outline measures that will help track and punish culprits that engage in spurious bad reporting just as is done in the United States by SEC Enforcement Division.

Second, evidence has suggested that the introduction of IFRS into the financial reporting regulation of Ghana seems to have yielded good fruits by helping to reduce earnings manipulation through reduced abnormal accruals. Using abnormal accruals as measures of earnings management, Dechow et al. (1996) and Chen et al. (2006) respectively report that firms that received invitation from the Security and Exchange Commission of the United States for charges of financial statements fraud and firms that were found to be fraudulent in China were systematically associated with higher level of abnormal accruals. **Government and its appropriate agencies** should therefore strengthen up institutions and structures which matter in order to cause a good number of firms across the country, both listed and unlisted, to comply substantively with IFRS. The essence of having firms produce financial information that contains less noise lies in the heart of enabling effective and efficient allocation of resources which ultimately affects economic growth positively. More so, the country stands to benefit from increased foreign investments because of enhanced transparency everywhere.

Third, evidence suggests that even though overall controlling shareholders monitor effectively this position is driven by the efforts of only locally private controlling shareholders but not state or foreign owners. This sends a signal that stateowned/controlled and foreign-owned/controlled entities are likely to report false accounting information.

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**Government** should take a cue from this and outline measures to constitute stronger financial reporting oversights. Such actions as requiring that all state organizations are audited by any of the Big 4 firms (especially so when the findings of this study suggest that these global auditing firms restrict earnings management) or strengthening board mechanisms by say appointing members based on competence and independence – if outsider – rather than on political attachment (especially when findings indicate that corporate board is just a perk of an office for firms) could be considered. If not perhaps, government could consider selling off good portion of its interests in these firms provided this option would not have any non-economic issues. Moreover, various sensitization programs and incentives should be laid on offer to sweep a lot more local entrepreneurs and locally-based private institutions into becoming large holders of voting shares all to ensure nation-wide improved information environment. Tax authorities should also exercise prudence and skill when assessing these firms for tax purpose especially multinationals as these tend to manipulate earnings down as part of their global tax avoidance schemes.

Fourth, to the **government and the various regulators especially the GSE**, it is recommended that serious attention should be given to looking deeper into corporate governance provisions or at worst to seeing to the enforcement of the current governance requirements. The study findings have made it apparently obvious that the wholesale importation of Western style of board structures does not necessarily map down into ensuring the right monitoring (González and García-Meca, 2014). Cai et al (2009) and Armstrong et al. (2010) share a liberal view that the context matters when defining codes to stimulate valid monitoring of management's actions including information disclosure. Perhaps, the ignorant and lofty belief of society and regulators that combining the roles of CEO and board chairperson into a single hand is necessarily a wise corporate decision even well before any thought is given should be aborted by regulators encouraging (rather than

stigmatizing) firms to combine these two roles if the uniqueness of their contexts supports so. For example, where it is known that CEOs have become so powerful due to resilient histories of decent performance and won loyalty of other —big guys‖ making it illusory to think the non-CEO chairperson can succeed in monitoring the CEO, the firm, in such a case, may be able to afford the status of no separation. Thus, the provision in the SEC's latest governance code for listed firms that more splitting is required between board and executive leaderships should be given a second look if information transparency is pursued by the GSE. Further, the independence redefinition and enforcement should also be considered by regulators.

Fifth, to **other emerging countries** especially close-by Sub-Saharan African countries pondering a switch to IFRS, it is recommended that the adoption of IFRS will probably improve upon their information environment making it the least unwise decision to take. It must be indicated that besides the likely improvement in earnings quality IFRS adoption promises many other benefits including acceptance by global giants such as UK, Canada, US, Australia, China, India, Brazil, European Union, South Africa, etc. which either switched to IFRS or strongly support its usage; improved information comparability; improved foreign investment inflows; among a lot more.

Sixth, **investors and other financiers** usually make decisions to fund, fund more, fund less or stop funding using information about performance typically provided in the company annual reports. A good decision cannot discernibly result without the support of quality information (Armstrong et al., 2010). On the basis of the evidence about how various governance mechanisms in listed firms are likely to integrate into differing monitoring marshals likely to affect quality in varying ways, it is suggested that investing community

and lenders should always study with diligence not only the financials but the corporate governance backgrounds of their firms before decisions are taken.

Finally, to **firms in Ghana, especially those trading on the GSE**, it is recommended that when composing and structuring their board they instead of doing what everyone else is doing should give credence to peculiarity of their firms. While the governance provisions of Ghana advise that there should be a balance between executives and non-executives who sit on corporate boards they do not mandate that necessarily more outsiders should feature on the board. Even though strong evidence exists elsewhere that it is almost certain that firms benefit from better monitoring by using more outside directors, such argument is not strongly supported in this study. The evidence of this study only offers that it is only at very high outsider proportion, 88%, that it is likely to attain even a reduction in board ineffectiveness suggesting that outside directors do not yet restrain earnings management but fuel it up after IFRS adoption at a reduced rate. This evidently implies that using more outside directors even though appease expectant on-lookers may lead to more agency costs. Therefore, each firm should keenly consider its context before composing its board. Firms are also advised to hire quality auditors to carry out at least their financial statements audits.

### 5.3.2 Suggestion of areas for further studies

The following areas are recommended for consideration in further studies:

First, even though many previous works have used abnormal accruals to measure opportunistic earnings management as done in this study, opponents may argue that abnormal accruals do not necessarily connote poor earnings quality but do reflect management's desire to efficiently communicate privately held information to shareholders and other users (Siregar and Utama, 2008). It is therefore suggested to the research world to

consider appropriate alternative measures such as opinion expressed in the auditor's report as used in Vichitsarawong and Pornupatham (2015) and complementary measures such as earnings, accrual and cash flow persistence and predictability measures to redo this study in the same context.

Second, this study uses only two measures (CEO/chairperson separation and proportion of outside directors) to look into the monitoring effectiveness of company boards, other areas such as board activity, board tenure, board financial expertise, board gender diversity and audit committee measures of size, composition, expertise and activity can also be used to determine the monitoring value of the board.

Third, the study uses only one definition of owning more than 50% of voting shares to construe the existence of controlling shareholder, other cut-offs such as 20%, 30% or 40% as used in Liu and Lu (2007) can be used to measure the same construct.

Fourth, this study concentrates only on internal monitoring mechanisms even though it controls for the effects of audit quality. It does seem promising that more insightful results are in the wait if the scope of the research extends to focus also on external monitoring mechanisms, specifically, external auditor features including size, auditor independence, audit firm rotation, audit partner rotation, audit firm industry specialization, among a lot more.

Fourth, the study unlike Bova and Pereira (2012) assumes that firms have equal level of compliance with IFRS. This assumption looks more expensive to accept than to reject as different firms are likely to have different levels of compliance because of varying levels of reporting incentives among firms (Daske et al. 2013). Therefore, future study can be conducted to take into account these likely differences in compliance levels before separating the IFRS effects.

Fifth, this study attempts to discount the potential impacts that contemporaneously institutional changes (as the accounting change) can have on the link between the switch to IFRS and earnings quality by rerunning the test models using a balanced data of same sets of firms before and after IFRS adoption but this approach might still be woefully inadequate as the approach does not address supra-effects of changes in macroeconomic variables such as inflation. Thus, it is recommended that a large number of firms that permits a cross-sectional study should be used in a future research that will retrospectively attempt to separate IFRS impacts on earning quality by designing the research around the 1$^{st}$ and 2$^{nd}$ years of adoption. Firms who report first-time under IFRS are obliged by IFRS 1 – *First-Time Adoption of International Financial Reporting Standards* to present statements that reconcile the information produced in the most previous year under the old GAAP to bring it in line with IFRS. Provided this information is available, the conduct of such research may perhaps produce less noisy results.

Sixth, the study attempts to minimize the impact of any potential endogeneity on the validity of the results obtained by applying an alternative estimator, the FE estimator as suggested by Ding et al. (2007). However, more sophisticated approaches such as the use of 2-stage least squares (see Liu and Lu, 2007) and simultaneous equation (Armstrong et al. 2010) models may be more appropriate when carrying any similar research in future.

Seventh and last, this study is conducted in a small country in terms of economic and political backgrounds. In order to bring more relevance to the outcome it turns out with, the study can be replicated in and extended to other similar settings in order to argue out a stronger case for the beneficial effects of IFRS in Sub-Saharan Africa and emerging economies as whole.

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## Appendix 1: Normality plots

*Figures showing probability of normality and Kernel density estimate tests for Models 1a, 1b and 2 in that order*

**Model 1a**
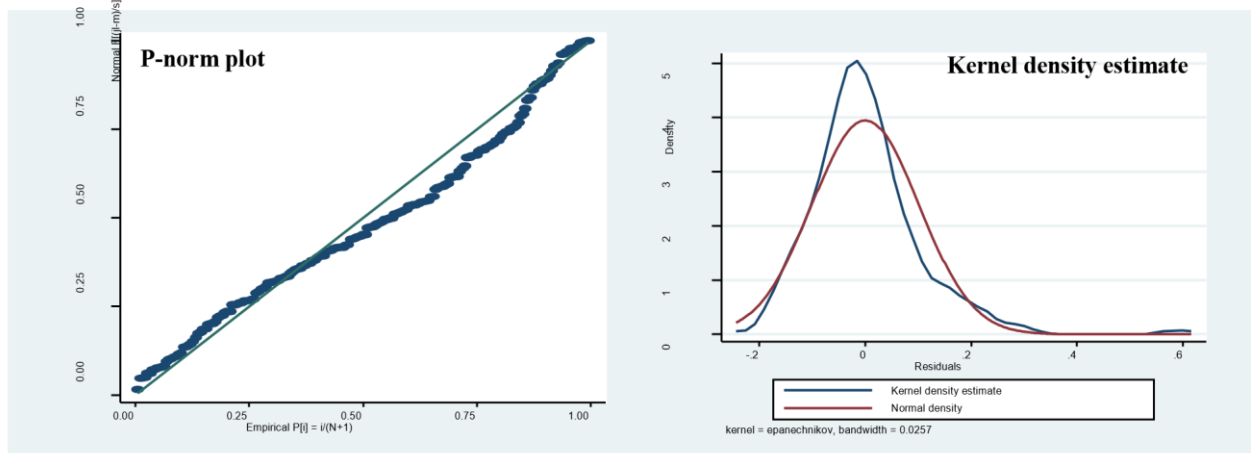


**Model 1b**
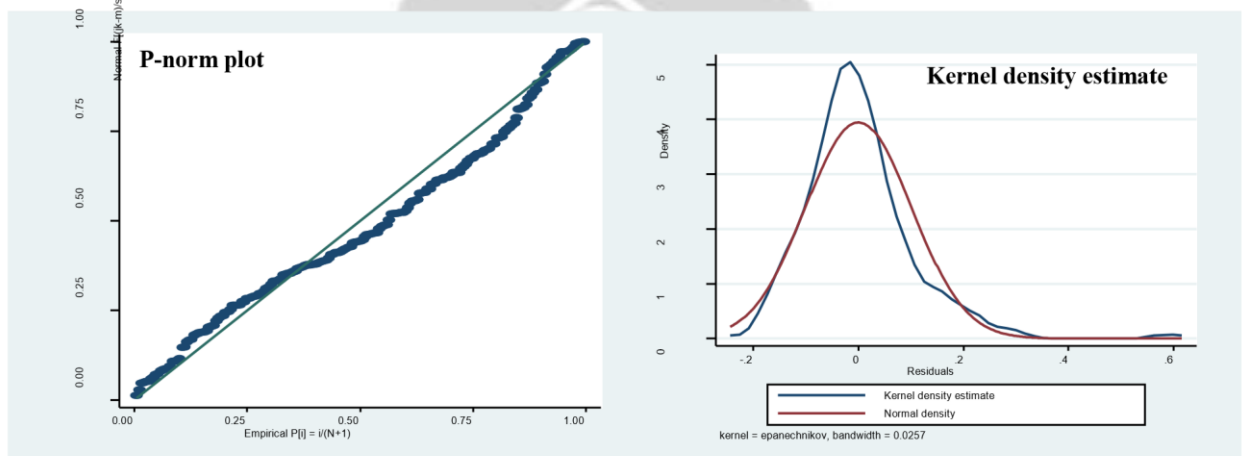


**Model 2**
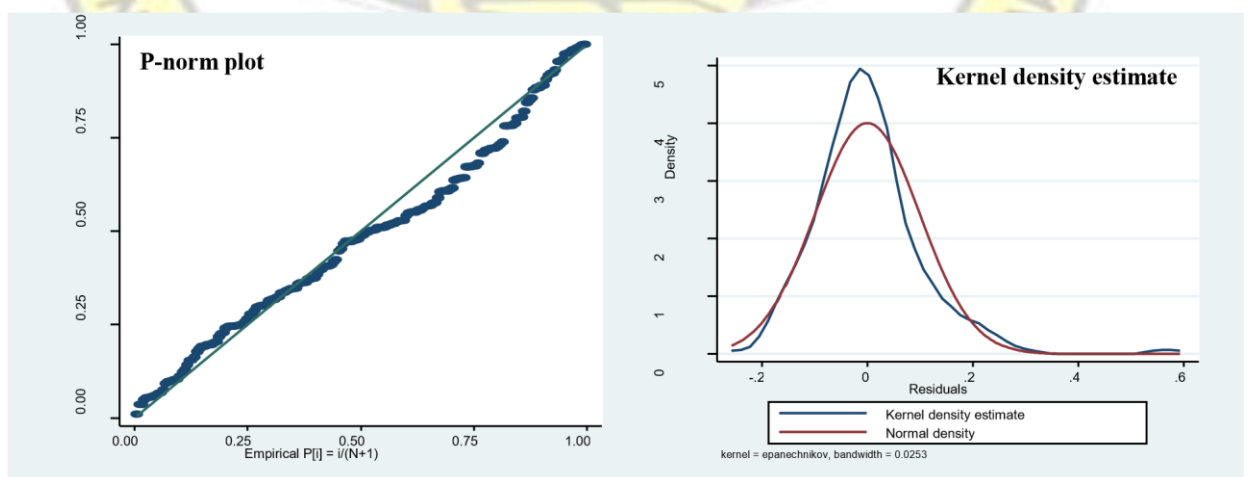
## Appendix 2: Heteroskedasticity plots for each of the three models: 1a, 1b and 2
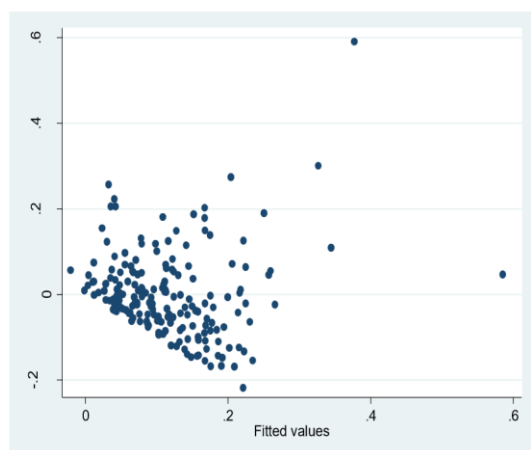
Model 1a                                              Model 1b
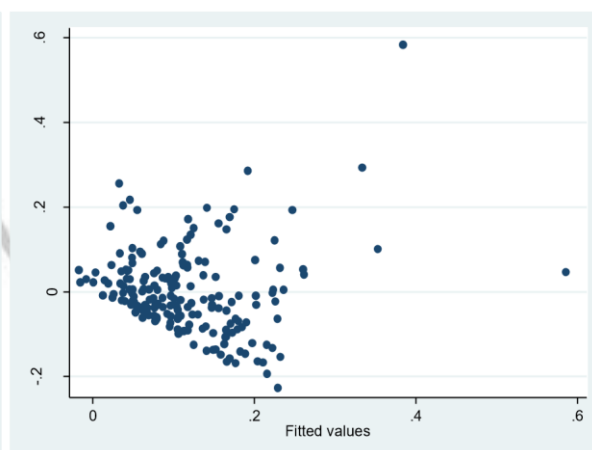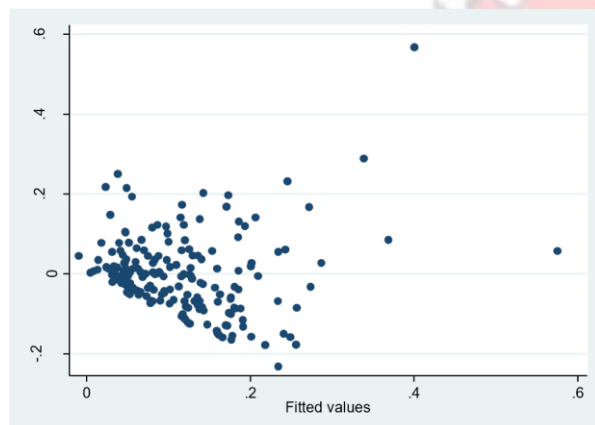


Model 2



## Appendix 3: Alternative definitions of outside dominated board

*Table showing the results of RE estimation of Model 1b and Model 2 with absolute value of abnormal working capital accruals (lagged by total assets) using 25th and 75th percentile cut-offs to separate outside dominated board from inside dominated board. Results of Model 1b are reported in Columns 1 and 2 while results of Model 2 are in Columns 3 and 4*

|  | Model 1b (1) | Model 1b (2) | Model 2 (3) | Model 2 (4) |
|---|---|---|---|---|
| IFRS | -0.0577*** | -0.0622*** | -0.0767* | -0.0728 |
|  | (-3.11) | (-3.33) | (-1.84) | (-1.32) |
| CONTR | -0.0771** | -0.0867*** | -0.0725** | -0.0732** |
|  | (-2.57) | (-2.89) | (-1.98) | (-1.96) |
| OUTDIR_DOM25 | - | 0.0200 | - | 0.0178 |
|  | - | (0.90) | - | (0.51) |

| | | | | |
|---|---|---|---|---|
| OUTDIR_DOM75 | 0.0817** | - | 0.141*** | - |
| | (2.36) | - | (3.47) | - |
| NODUAL | 0.0319 | 0.0440 | -0.00992 | 0.0331 |
| | (1.20) | (1.61) | (-0.28) | (0.93) |
| IFRS*CONTR | - | - | -0.00731 | -0.0258 |
| | - | - | (-0.22) | (-0.79) |
| IFRS*OUTDIR_DOM25 | - | - | - | 0.000458 |
| | - | - | - | (0.01) |
| IFRS*OUTDIR_DOM75 | - | - | -0.107** | - |
| | - | - | (-2.47) | - |
| IFRS*NODUAL | - | - | 0.0598 | 0.0293 |
| | - | - | (1.43) | (0.69) |
| TOP1 | 0.134* | 0.162** | 0.146* | 0.175** |
| | (1.75) | (2.15) | (1.91) | (2.16) |
| BSIZE | -0.00597 | -0.000497 | -0.00218 | -0.000317 |
| | (-0.86) | (-0.07) | (-0.31) | (-0.05) |
| S_GROWTH | 0.0329*** | 0.0310*** | 0.0361*** | 0.0319*** |
| | (3.49) | (3.25) | (3.83) | (3.29) |
| LEV | -0.0287 | -0.0226 | -0.0252 | -0.0202 |
| | (-0.91) | (-0.71) | (-0.80) | (-0.61) |
| LOG_REV | 0.0122 | 0.0181** | 0.0109 | 0.0177* |
| | (1.39) | (2.16) | (1.24) | (1.95) |
| A_QUA | -0.0898*** | -0.105*** | -0.0818*** | -0.101*** |
| | (-3.35) | (-3.95) | (-3.03) | (-3.56) |
| LAG1_LOSS | 0.110*** | 0.110*** | 0.108*** | 0.109*** |
| | (4.50) | (4.46) | (4.45) | (4.32) |
| INTERCEPT | -0.0252 | -0.176 | -0.0334 | -0.177 |
| | (-0.20) | (-1.58) | (-0.26) | (-1.39) |
| | | | | |
| Overall $R^2$ | 36.2% | 35.7% | 40.1% | 35.9% |
| Within $R^2$ | 28.2% | 25.1% | 30.8% | 25.9% |
| Between $R^2$ | 47.7% | 54.0% | 53.0% | 52.1% |
| Significance | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | | | | |
| **Number of Observation** | **187** | **187** | **187** | **187** |

*Note: t-statistic is reported in parenthesis; *, ** and *** indicate significance at p<0.10, p<0.05 and p<0.01 respectively.*

## Appendix 4: Balanced dataset

*RE estimations of Models 1a, 1b and 2 with absolute value of abnormal working capital accruals (lagged by total assets) using balanced dataset*

| | (1) | (2) | (3) |
|---|---|---|---|
| IFRS | -0.0476* | -0.0517* | -0.00965 |
| | (-1.75) | (-1.92) | (-0.13) |
| CONTR | -0.136** | -0.143*** | -0.126** |
| | (-2.51) | (-2.63) | (-2.11) |

| | (1) | (2) | (3) |
|---|---|---|---|
| OUTDIR_PROP | - | 0.181 | - |
| | - | (1.13) | - |
| OUTDIR_DOM | 0.0418 | - | 0.0698 |
| | (0.94) | - | (1.55) |
| NODUAL | 0.0795 | 0.0773 | 0.0564 |
| | (1.63) | (1.60) | (1.13) |
| IFRS*CONTR | - | - | -0.0206 |
| | - | - | (-0.38) |
| IFRS*OUTDIR_DOM | - | - | -0.0683 |
| | - | - | (-0.96) |
| IFRS*NODUAL | - | - | -0.0166 |
| | - | - | (-0.21) |
| TOP1 | 0.393** | 0.416*** | 0.341** |
| | (2.56) | (2.73) | (2.45) |
| BSIZE | 0.00398 | 0.00772 | 0.00436 |
| | (0.31) | (0.64) | (0.37) |
| S_GROWTH | 0.0302** | 0.0296** | 0.0344*** |
| | (2.38) | (2.34) | (2.67) |
| LEV | -0.114 | -0.138 | -0.0714 |
| | (-1.28) | (-1.57) | (-0.86) |
| LOG_REV | 0.00279 | 0.00568 | 0.0105 |
| | (0.17) | (0.35) | (0.80) |
| A_QUA | -0.0941* | -0.0996** | -0.104** |
| | (-1.90) | (-2.02) | (-2.28) |
| LAG1_LOSS | 0.138*** | 0.144*** | 0.131*** |
| | (3.23) | (3.39) | (3.15) |
| INTERCEPT | -0.0469 | -0.248 | -0.160 |
| | (-0.22) | (-0.95) | (-0.92) |
| Overall $R^2$ Between | 35.8% | 35.5% | 40.6% |
| $R^2$ | 36.4% | 37.0% | 34.8% |
| Within $R^2$ | 35.3% | 33.6% | 51.0% |
| Significance | 0.0000 | 0.0000 | 0.0000 |
| **Number of Observation** | **90** | **90** | **90** |

*Note: t-statistic is reported in parenthesis; *, ** and *** indicate significance at $p<0.10$, $p<0.05$ and $p<0.01$ respectively.*

## Appendix 5: Replacing log of revenue with log of assets

*RE estimation of Models 1a, 1b and 2 with absolute value of abnormal working capital accruals (lagged by total assets) using log of assets as measure of firm size. Columns 1, 2 and 3 report the results of Models 1a, 1b and 2 respectively*

| | (1) | (2) | (3) |
|---|---|---|---|

| | | | |
|---|---|---|---|
| IFRS | -0.0484** | -0.0417** | -0.0348 |
| | (-2.42) | (-2.08) | (-0.79) |
| CONTR | -0.0741** | -0.0716** | -0.0671* |
| | (-2.36) | (-2.30) | (-1.72) |
| OUTDIR_PROP | 0.114 | - | - |
| | (1.31) | - | - |
| OUTDIR_DOM | - | 0.0639** | 0.0829** |
| | - | (2.24) | (2.50) |
| NODUAL | 0.0572** | 0.0568** | 0.0439 |
| | (2.00) | (2.03) | (1.22) |
| IFRS*CONTR | - | - | -0.0145 |
| | - | - | (-0.42) |
| IFRS*OUTDIR_DOM | - | - | -0.0448 |
| | - | - | (-1.16) |
| IFRS*NODUAL | - | - | 0.0186 |
| | - | - | (0.44) |
| TOP1 | 0.200** | 0.177** | 0.193** |
| | (2.47) | (2.17) | (2.27) |
| BSIZE | 0.00471 | -0.000270 | 0.00203 |
| | (0.67) | (-0.04) | (0.26) |
| S_GROWTH | 0.0339*** | 0.0345*** | 0.0358*** |
| | (3.55) | (3.64) | (3.74) |
| LEV | -0.0266 | -0.0212 | -0.0198 |
| | (-0.81) | (-0.65) | (-0.59) |
| LOG_ASSETS | 0.000382 | -0.00365 | -0.00417 |
| | (0.03) | (-0.32) | (-0.35) |
| A_QUA | -0.0909*** | -0.0849*** | -0.0824*** |
| | (-3.17) | (-2.95) | (-2.78) |
| LAG1_LOSS | 0.0962*** | 0.0966*** | 0.0978*** |
| | (3.85) | (3.90) | (3.91) |
| INTERCEPT | -0.0448 | 0.134 | 0.112 |
| | (-0.27) | (0.85) | (0.67) |
| Overall $R^2$ | 30.7% | 31.9% | 33.2% |
| Within $R^2$ | 26.1% | 27.7% | 28.4% |
| Between $R^2$ | 37.0% | 38.6% | 41.2% |
| Significance | 0.0000 | 0.0000 | 0.0000 |
| **Number of Observation** | **187** | **187** | **187** |

*Note: t-statistic is reported in parenthesis; *, ** and *** indicate significance at p<0.10, p<0.05 and p<0.01 respectively.*

## Appendix 6: Controlling for return on assets

*RE estimation of Models 1a, 1b and 2 with absolute value of abnormal working capital accruals (lagged by total assets)after controlling for ROA. Columns 1, 2 and 3 report the results of Models 1a, 1b and 2 respectively*

| | Model 1a (1) | Model 1b (2) | Model 2 (3) |
|---|---|---|---|
| IFRS | -0.0629*** | -0.0625*** | -0.0630 |
| | (-2.72) | (-2.70) | (-1.26) |
| CONTR | -0.0702* | -0.0712* | -0.0556 |
| | (-1.88) | (-1.89) | (-1.21) |
| OUTDIR_PROP | 0.0998 | - | - |
| | (0.87) | - | - |
| OUTDIR_DOM | - | 0.00915 | 0.00496 |
| | - | (0.33) | (0.17) |
| NODUAL | 0.0844** | 0.0779** | 0.0627 |
| | (2.31) | (2.17) | (1.41) |
| IFRS*CONTR | - | - | -0.0365 |
| | - | - | (-0.92) |
| IFRS* OUTDIR_DOM | - | - | 0.00350 |
| | - | - | (0.08) |
| IFRS*NODUAL | - | - | 0.0233 |
| | - | - | (0.49) |
| TOP1 | 0.214 | 0.220 | 0.246 |
| | (1.39) | (1.41) | (1.50) |
| BSIZE | 0.00156 | 0.00316 | 0.00355 |
| | (0.18) | (0.34) | (0.36) |
| S_GROWTH | 0.0311*** | 0.0316*** | 0.0339*** |
| | (2.82) | (2.86) | (2.98) |
| LEV | -0.0347 | -0.0349 | -0.0293 |
| | (-0.90) | (-0.90) | (-0.73) |
| LOG_REV | 0.0117 | 0.0118 | 0.0121 |
| | (0.60) | (0.59) | (0.60) |
| A_QUA | -0.104** | -0.102** | -0.101** |
| | (-2.40) | (-2.32) | (-2.24) |
| LAG1_LOSS | 0.109*** | 0.109*** | 0.107*** |
| | (3.87) | (3.88) | (3.78) |
| ROA | -0.0429 | -0.0487 | -0.0641 |
| | (-0.61) | (-0.70) | (-0.89) |
| INTERCEPT | -0.209 | -0.148 | -0.166 |
| | (-0.68) | (-0.49) | (-0.53) |
| | | | |
| Overall $R^2$ Between | | | |
| $R^2$ | 31.4% 26.9% | 31.0% 26.6% | 31.0% 27.2% |
| Within $R^2$ | 37.7% | 37.4% | 37.0% |
| Significance | 0.0000 | 0.0000 | 0.0000 |
| | | | |
| **Number of Observation** | **187** | **187** | **187** |

## Appendix 7: Controlling for cash flows from operations

*RE estimation of Models 1a, 1b and 2 with absolute value of abnormal working capital accruals (lagged by total assets) after controlling for CFO. Columns 1, 2 and 3 report the results of Models 1a, 1b and 2 respectively*

|  | Model 1a (1) | Model 1b (2) | Model 2 (3) |
|---|---|---|---|
| IFRS | -0.0641*** | -0.0577*** | -0.0509 |
|  | (-3.43) | (-3.07) | (-1.18) |
| CONTR | -0.0850*** | -0.0790** | -0.0732* |
|  | (-2.75) | (-2.56) | (-1.89) |
| OUTDIR_PROP | 0.105 | - | - |
|  | (1.24) | - | - |
| OUTDIR_DOM | - | 0.0568** | 0.0801** |
|  | - | (1.97) | (2.34) |
| NODUAL | 0.0453 | 0.0441 | 0.0336 |
|  | (1.64) | (1.62) | (0.94) |
| IFRS*CONTR | - | - | -0.0127 |
|  | - | - | (-0.37) |
| IFRS*OUTDIR_DOM | - | - | -0.0490 |
|  | - | - | (-1.28) |
| IFRS*NODUAL | - | - | 0.0197 |
|  | - | - | (0.47) |
| TOP1 | 0.165** | 0.144* | 0.162* |
|  | (2.13) | (1.83) | (1.88) |
| BSIZE | -0.00140 | -0.00501 | -0.00225 |
|  | (-0.21) | (-0.70) | (-0.29) |
| S_GROWTH | 0.0311*** | 0.0322*** | 0.0336*** |
|  | (3.27) | (3.40) | (3.49) |
| LEV | -0.0214 | -0.0152 | -0.0135 |
|  | (-0.66) | (-0.47) | (-0.41) |
| LOG_REV | 0.0169* | 0.0116 | 0.0101 |
|  | (1.93) | (1.25) | (1.01) |
| LAG1_LOSS | 0.106*** | 0.103*** | 0.103*** |
|  | (4.24) | (4.09) | (4.03) |
| A_QUA | -0.101*** | -0.0936*** | -0.0895*** |
|  | (-3.73) | (-3.40) | (-3.06) |
| CFO | 0.0247 | 0.0402 | 0.0432 |
|  | (0.70) | (1.14) | (1.21) |
| INTERCEPT | -0.224* | -0.0441 | -0.0586 |
|  | (-1.67) | (-0.34) | (-0.40) |
| Overall $R^2$ | 35.9% |  |  |
| Within $R^2$ | 26.0% | 35.9% 27.5% | 37.3% 28.4% |

| | Between $R^2$ | 52.1% | 48.8% | 51.6% |
| | P | 0.0000 | 0.0000 | 0.0000 |

*Note: t-statistic is reported in parenthesis; \*, \*\* and \*\*\* indicate significance at p<0.10, p<0.05 and p<0.01 respectively.*

## Appendix 8: FE estimations

*FE estimation of Models 1a, 1b and 2 with absolute value of abnormal working capital accruals (lagged by total assets).*

| | Model 1a (1) | Model 1b (2) | Model 2 (3) |
|---|---|---|---|
| IFRS | -0.0599*** | -0.0524** | -0.0422 |
| | (-2.66) | (-2.32) | (-0.85) |
| CONTR | -0.0700* | -0.0652* | -0.0542 |
| | (-1.89) | (-1.77) | (-1.21) |
| OUTDIR_PROP | 0.109 | - | - |
| | (0.96) | - | - |
| OUTDIR_DOM | - | 0.0731* | 0.0797** |
| | - | (1.91) | (1.99) |
| NODUAL | 0.0872** | 0.0877** | 0.0727* |
| | (2.42) | (2.51) | (1.70) |
| IFRS*CONTR | - | - | -0.0289 |
| | - | - | (-0.78) |
| IFRS*OUTDIR_DOM | - | - | -0.0192 |
| | - | - | (-0.45) |
| IFRS*NODUAL | - | - | 0.0154 |
| | - | - | (0.33) |
| TOP1 | 0.218 | 0.191 | 0.221 |
| | (1.43) | (1.26) | (1.40) |
| BSIZE | 0.00151 | -0.00335 | -0.00133 |
| | (0.17) | (-0.37) | (-0.14) |
| S_GROWTH | 0.0296*** | 0.0299*** | 0.0320*** |
| | (2.76) | (2.81) | (2.95) |
| LEV | -0.0292 | -0.0145 | -0.00956 |
| | (-0.78) | (-0.38) | (-0.25) |
| LOG_REV | 0.00807 | 0.00126 | 0.000317 |
| | (0.43) | (0.07) | (0.02) |
| A_QUA | -0.104** | -0.106** | -0.103** |
| | (-2.41) | (-2.50) | (-2.39) |
| LAG1_LOSS | 0.110*** | 0.113*** | 0.112*** |
| | (3.93) | (4.08) | (4.02) |
| INTERCEPT | -0.166 | 0.0526 | 0.0347 |

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|  | (-0.56) | (0.18) | (0.12) |
|---|---|---|---|
| Overall $R^2$ |  |  | 31.0% |
| Within $R^2$ | 30.6% 26.7% | 30.3% 28.0% | 28.6% |
| Between $R^2$ | 35.4% | 34.7% | 36.1% |
| Significance | 0.0000 | 0.0000 | 0.0000 |
| **Number of Observation** | **187** | **187** | **187** |

*Note: t-statistic is reported in parenthesis; \*, \*\* and \*\*\* indicate significance at p<0.10, p<0.05 and p<0.01 respectively.*

## Appendix 9: Different types of controlling shareholding

*RE estimation of Models 1a and 1b with absolute value of abnormal working capital accruals (lagged by total assets) and different forms of controlling shareholding. Columns 1, 2 and 3 report the results of Model 1a respectively for state-controlling shareholding, foreign investor controlling shareholding and locally private controlling shareholding and Columns 4, 5 and 6 report the results of Model 1b respectively for state-controlling shareholding, foreign investor controlling shareholding and locally private controlling shareholding*

| | | Model 1a | | | Model 1b | |
|---|---|---|---|---|---|---|
| Overall $R^2$ | 28.9% | 29.9% | 34.0% | 29.9% | 29.9% | 35.1% |
| Within $R^2$ | 25.1% | 24.0% | 21.3% | 26.0% | 25.3% | 23.0% |
| Between $R^2$ | 35.4% | 39.8% | 54.7% | 36.2% | 37.3% | 53.7% |
| Significance | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Number of | 187 | 187 | 187 | 187 | 187 | 187 |

|  | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| IFRS | -0.0583*** | -0.0556*** | -0.0663*** | -0.0517*** | -0.0507*** | -0.0602*** |
|  | (-3.08) | (-2.93) | (-3.42) | (-2.71) | (-2.65) | (-3.08) |
| STCONTR | -0.0474 | - | - | -0.0446 | - | - |
|  | (-1.18) | - | - | (-1.16) | - | - |
| FCONTR | - | -0.0202 | - | - | -0.00469 | - |
|  | - | (-0.58) | - | - | (-0.13) | - |
| LCONTR | - | - | -0.0795*** | - | - | -0.0896*** |
|  | - | - | (-2.58) | - | - | (-2.94) |
| OUTDIR_PROP | 0.115 | 0.0926 | 0.0450 | - | - | - |
|  | (1.31) | (1.05) | (0.68) | - | - | - |
| OUTDIR_DOM | - | - | - | 0.0549* | 0.0515* | 0.0438* |
|  | - | - | - | (1.91) | (1.69) | (1.88) |
| NODUAL | 0.0510* | 0.0493* | 0.00607 | 0.0456* | 0.0480* | 0.00824 |
|  | (1.80) | (1.73) | (0.26) | (1.66) | (1.72) | (0.35) |
| TOP1 | 0.0456 | 0.0526 | 0.0101 | 0.0277 | 0.0251 | 0.00450 |
|  | (0.72) | (0.73) | (0.23) | (0.45) | (0.34) | (0.10) |
| BSIZE | 0.000454 | -0.000163 | -0.00406 | -0.00332 | -0.00351 | -0.00705 |
|  | (0.07) | (-0.02) | (-0.71) | (-0.47) | (-0.47) | (-1.19) |
| S_GROWTH | 0.0301*** | 0.0314*** | 0.0308*** | 0.0316*** | 0.0320*** | 0.0324*** |
|  | (3.08) | (3.22) | (3.18) | (3.25) | (3.30) | (3.35) |
| LEV | -0.0180 | -0.0250 | 0.000748 | -0.0131 | -0.0178 | -0.000696 |
|  | (-0.55) | (-0.75) | (0.03) | (-0.40) | (-0.53) | (-0.02) |
| LOG_REV | 0.0158 | 0.0125 | 0.0147** | 0.0123 | 0.00867 | 0.0105 |
|  | (1.77) | (1.41) | (2.35) | (1.39) | (0.94) | (1.59) |
| LAG1_LOSS | 0.107*** | 0.0988*** | 0.0982*** | 0.104*** | 0.0990*** | 0.0933*** |
|  | (4.13) | (3.90) | (4.27) | (4.08) | (3.92) | (4.07) |
| A_QUA | -0.104*** | -0.0895*** | -0.118*** | -0.0982*** | -0.0884*** | -0.115*** |
|  | (-3.65) | (-3.02) | (-5.36) | (-3.54) | (-2.99) | (-5.26) |
| INTERCEPT | -0.214 | -0.147 | -0.0392 | -0.0466 | 0.00688 | 0.0755 |
|  | (-1.48) | (-1.08) | (-0.42) | (-0.37) | (0.05) | (0.84) |
| **Observation** |  |  |  |  |  |  |

*Note: t-statistic is reported in parenthesis; *, ** and *** indicate significance at $p<0.10$, $p<0.05$ and $p<0.01$ respectively.*

**Appendix 10: Alternative dependent variable**

*RE estimation of Models 1a, 1b and 2 with absolute value of abnormal working capital accruals (lagged by revenue).*

|  | Model 1a (1) | Model 1b (2) | Model 2 (3) |
|---|---|---|---|
| IFRS | -0.0928*** | -0.0937*** | -0.0559 |
|  | (-5.10) | (-5.10) | (-1.36) |
| CONTR | -0.0568** | -0.0550** | -0.0371 |
|  | (-2.08) | (-2.02) | (-1.04) |
| OUTDIR_PROP | 0.0314 | - | - |
|  | (0.43) | - | - |
| OUTDIR_DOM | - | -0.0100 | -0.00857 |

|  | (1) | (2) | (3) |
|---|---|---|---|
|  | - | (-0.41) | (-0.28) |
| NODUAL | 0.0591** | 0.0563** | 0.0760** |
|  | (2.39) | (2.30) | (2.29) |
| IFRS*CONTR | - | - | -0.0180 |
|  | - | - | (-0.56) |
| IFRS*OUTDIR_DOM | - | - | 0.00264 |
|  | - | - | (0.07) |
| IFRS*NODUAL | - | - | -0.0350 |
|  | - | - | (-0.90) |
| TOP1 | 0.112* | 0.112* | 0.109 |
|  | (1.69) | (1.69) | (1.49) |
| BSIZE | 0.000713 | 0.00191 | 0.00194 |
|  | (0.12) | (0.29) | (0.28) |
| S_GROWTH | 0.0214** | 0.0213** | 0.0216** |
|  | (2.43) | (2.42) | (2.40) |
| LEV | 0.00244 | 0.00236 | 0.00503 |
|  | (0.08) | (0.08) | (0.16) |
| SIZE | -0.00183 | -0.00139 | -0.00286 |
|  | (-0.20) | (-0.15) | (-0.28) |
| A_QUA | -0.0420* | -0.0425* | -0.0402 |
|  | (-1.76) | (-1.77) | (-1.55) |
| LAG1_LOSS | 0.0707*** | 0.0716*** | 0.0737*** |
|  | (3.17) | (3.20) | (3.19) |
| INTERCEPT | 0.0972 | 0.110 | 0.107 |
|  | (0.73) | (0.89) | (0.76) |
| Overall $R^2$ | 30.0% | 30.1% 28.0% | 30.0% 28.8% |
| Within $R^2$ | 38.0% |  |  |
| Between $R^2$ | 44.2% | 44.6% | 40.9% |
| Significance | 7.89e-11 | 8.06e-11 | 1.50e-09 |
| **Number of Observation** | **187** | **187** | **187** |

*Note: t-statistic is reported in parenthesis; \*, \*\* and \*\*\* indicate significance at p<0.10, p<0.05 and p<0.01 respectively.*

**Appendix 11: Expanded definitions of all variables used**

| Variables | Definitions | Expected signs |
|---|---|---|
| ABS_AWCA | Refers to absolute value of abnormal working capital accruals (lagged by total assets or revenue) | |
| IFRS | A dummy variable that takes the value of 1 if a firm reports under IFRS and 0 otherwise (Marra et al. 2011; Daske et al. 2013). | − |
| CONTR | A dummy variable that takes the value of 1 if there is a controlling shareholding defined by an owner holding directly and/or indirectly more than 50% of firm's ordinary shares and 0 otherwise | +/ − |
| STCONTR | A dummy variable that takes the value of 1 if there is a state controlling shareholding defined by government holding directly and/or indirectly (through SSNIT, Ministries and Ghana Cocoa Board in line with Greif, 2012) more than 50% of firm's ordinary shares and 0 otherwise | +/ − |
| FCONTR | A dummy variable that takes the value of 1 if there is a foreign investor controlling shareholding defined by an owner holding directly and/or indirectly more than 50% of firm's ordinary shares and 0 otherwise | +/ − |
| LCONTR | A dummy variable that takes the value of 1 if there is a locally private controlling shareholding defined by an owner holding directly and/or indirectly more than 50% of firm's ordinary shares and 0 otherwise | +/ − |
| OUTDIR_PROP | A continuous variable proportion of outside directors represented on company board at the yearend (Abor, 2007; Marra et al. 2011; González and García-Meca, 2014) | +/ − |
| OUTDIR_DOM | A dichotomous variable that is given a value of 1 if the proportion of outside directors represented on company board exceeds the $50^{th}$ percentile cut-off point and otherwise | +/ − |
| OUTDIR_DOM25 | A dichotomous variable that is given a value of 1 if the proportion of outside directors represented on company board exceeds the $25^{th}$ percentile cut-off point and otherwise | +/ − |
| OUTDIR_DOM75 | A dichotomous variable that is given a value of 1 if the proportion of outside directors represented on company board exceeds the $75^{th}$ percentile cut-off point and otherwise | +/ − |
| NODUAL | A dummy variable that takes the value of 1 if the firm's CEO does not double as the chairperson of the board at the year end and 0 otherwise (Prencipe and Bar- Yosef, 2011) | +/ − |
| IFRS*CONTR | Interaction term between post-IFRS and presence of controlling shareholder | +/ − |
| IFRS* OUTDIR_DOM | An interaction term between post-IFRS and the dichotomous measure of proportion of outside directors on the company board based on $50^{th}$ percentile cut-off point | +/ − |
| IFRS* OUTDIR_DOM25 | An interaction term between post-IFRS and the dichotomous measure of proportion of outside directors on the company board based on $25^{th}$ percentile cut-off point | +/ − |
| IFRS* OUTDIR_DOM75 | An interaction term between post-IFRS and the dichotomous measure of proportion of outside directors on the company board based on $75^{th}$ percentile cut-off point | +/ − |
| IFRS*NODUAL | An interaction term between post-IFRS and absence of CEO duality | +/ − |
| TOP1 | A continuous variable defined as the percentage of equity shares held by the top one shareholder (Marra et al., 2011) | +/ − |
| BSIZE | A continuous variable defined as the total number of board members (Marra et al., 2011) | +/ − |
| S_GROWTH | A continuous variable defined as the change in sales from year *t-1* to *year* t over sales in year *t-1* (Marra et al., 2011) | + |
| LEV | A continuous variable defined as total liabilities over total assets (Marra et al., 2011) | +/ − |
| LOG_REV | A continuous variable defined as natural logarithm of total revenue (Cheng and Zhang, 2014) | +/ − |
| LAG1_LOSS | A dummy variable that takes a value of 1 if a firm reports loss one year before and 0 otherwise (Marra et al., 2011) | + |
| A_QUA | A dummy variable that takes a value of 1 if a firm is audited by a Big 4 auditing firm and 0 otherwise (Marra et al., 2011; Bokpin, 2013) | − |
| ROA | A continuous variable defined as net profit after tax over beginning total assets (Marra et al., 2011) | − |
| CFO | A continuous variable defined as net cash flows from operating activities over beginning total assets (Marra et al., 2011) | − |

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**Appendix 12: List of Firms used and sample selection procedure**

**Panel A**

| Firm | Abbreviation | Industry |
|---|---|---|
| 1. African Champions Indus. | ACI | 1 |
| 2. Aluworks | ALW | 1 |
| 3. Ayrton Drugs | AYR | 1 |
| 4. Benso Oil Palm Plantation | BOPP | 1 |
| 5. CFAO Motors | CFAO | 2 |
| 6. Clydestone | CLYD | 2 |
| 7. Camelot | CMT | 1 |
| 8. Cocoa Processing Co. | CPC | 3 |
| 9. Fan Milk Ghana | FML | 3 |
| 10. Guinness Ghana Breweries Limited | GGBL | 3 |
| 11. Ghana Oil Company | GOIL | 2 |
| 12. Golden Web | GWEB | 1 |
| 13. Mechanical Lloyd | MLC | 2 |
| 14. Producing Buying Company | PBC | 2 |
| 15. Pioneer Kitchenware | PKL | 1 |
| 16. PZ Cussons | PZ | 1 |
| 17. Starwin Products Limited | SPL | 1 |
| 18. Sam Woode Limited | SWL | 1 |
| 19. Total Ghana Limited | TOTAL | 2 |
| 20. Transaction Solutions | TRANSOL | 2 |
| 21. Unilever Ghana Limited | UNIL | 1 |

*1 = Manufacturing*

*2 = Services*

*3 = Consumer*

*Pharmaceuticals and printing were added to manufacturing, which also included agroprocessing. Distribution, ICT, and trading were added to services. Insurance and banks were noted as "financial" and removed from the sample. Food and beverage was marked as consumer.*

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**Panel B: Sample selection procedure**

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | POOLED |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Possible initial sample | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 390 |
| Firms not yet listed | (10) | (8) | (2) | (2) | (0) | (0) | (0) | (0) | (0) | (0) | (22) |
| Firms in the financial and insurance sectors | (8) | (8) | (10) | (10) | (11) | (11) | (11) | (11) | (11) | (11) | (102) |
| Firms in the mining and oil sectors | (1) | (1) | (1) | (2) | (2) | (2) | (2) | (3) | (3) | (3) | (20) |
| Firms delisted | (0) | (1) | (0) | (1) | (0) | (0) | (0) | (2) | (0) | (0) | (4) |
| Missing data | (5) | (6) | (6) | (3) | (5) | (5) | (6) | (3) | (7) | (9) | (55) |
| **Total** | **15** | **15** | **20** | **21** | **21** | **21** | **20** | **20** | **18** | **16** | **187** |
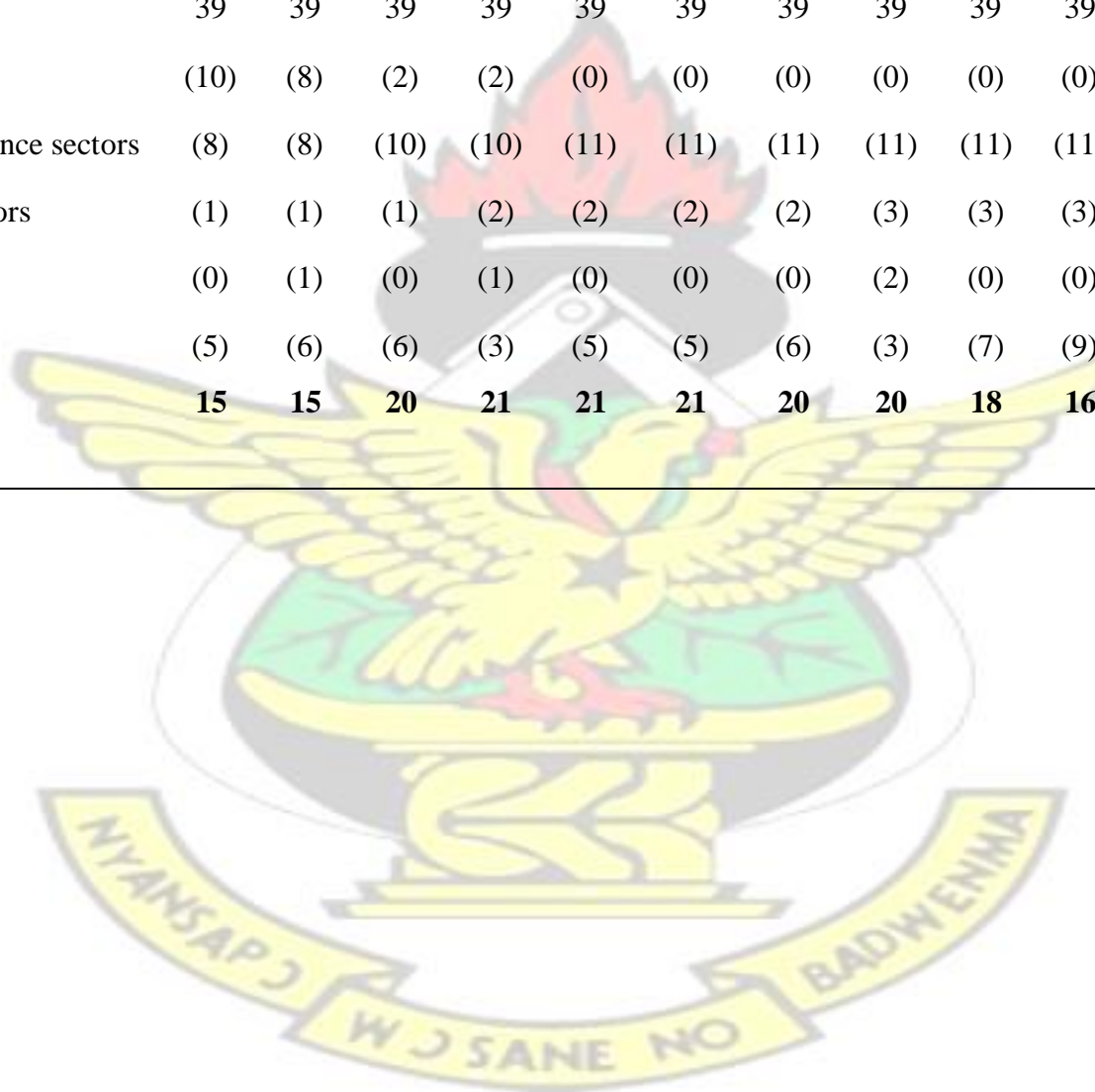
# Appendix 13: Raw Data

| FIRMS | FIRM ID | YEAR | INDUS | T ASSETS | ABS AWCA | AWCA BY REV | B IND | LOG REV | OUTDIR DOM75 | OUTDIR DOM25 | OUTDIR DOM | NODUAL | CONTR | STCONTR | FCONTR | LCONTR | TOP1 | BSIZE | ROA | GROWTH | LEV | A QUA | LAG1 LOSS | IFRS | CFO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ACI | 1 | 2004 | 1 | 1.40E+06 | 0.05821 | 0.026943677 | 0.77778 | 14.89 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.1481 | 9 | -0.03118 | 0.26962 | 0.71651 | 1 | 1 | 0 | 0.0415 |
| ACI | 1 | 2005 | 1 | 3.80E+06 | 0.18684 | 0.234 | 0.75 | 14.7 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.1481 | 8 | -0.32962 | -0.17317 | 0.36425 | 1 | 1 | 0 | -0.0132 |
| ACI | 1 | 2006 | 1 | 3.50E+06 | 0.34582 | 0.4532 | 0.75 | 14.83 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.1898 | 8 | -0.14577 | 0.13472 | 0.45359 | 1 | 1 | 0 | 0.0138 |
| ACI | 1 | 2007 | 1 | 3.60E+06 | 0.11771 | 0.137720603 | 0.71429 | 14.95 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.1777 | 7 | 0.01876 | 0.12808 | 0.46148 | 1 | 1 | 1 | 0.0572 |
| ACI | 1 | 2008 | 1 | 8.50E+06 | 0.0075 | 0.0009 | 0.71429 | 14.92 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.137 | 7 | -0.18618 | -0.02827 | 0.29873 | 1 | 0 | 1 | -0.1157 |
| ACI | 1 | 2009 | 1 | 8.80E+06 | 0.00029 | 0.000654805 | 0.85714 | 15.19 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.137 | 7 | -0.05383 | 0.31213 | 0.37264 | 1 | 1 | 1 | -0.0021 |
| ACI | 1 | 2010 | 1 | 9.10E+06 | 0.06979 | 0.141967666 | 0.85714 | 15.31 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.1501 | 7 | -0.03223 | 0.13112 | 0.43361 | 1 | 1 | 1 | -0.0662 |
| ACI | 1 | 2011 | 1 | 9.90E+06 | 0.04155 | 0.109705654 | 0.83333 | 15.14 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.1137 | 6 | -0.13298 | -0.15969 | 0.48711 | 1 | 1 | 1 | -0.1406 |
| ACI | 1 | 2012 | 1 | 1.00E+07 | 0.24034 | 0.00021 | 0.83333 | 15.17 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.1137 | 6 | -0.29716 | 0.0315 | 0.17407 | 1 | 1 | 1 | -0.1252 |
| ACI | 1 | 2013 | 1 | 4.90E+06 | 0.04031 | 0.00241 | 0.85714 | 14.62 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.1481 | 7 | -0.58973 | -0.42033 | 0.2643 | 1 | 1 | 1 | -0.2009 |
| ALW | 2 | 2004 | 1 | 2.00E+07 | 0.3171 | 0.14008822 | 0.88889 | 17.64 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0.249 | 9 | 0.00732 | 0.2135 | 0.04327 | 1 | 1 | 0 | 0.2294 |
| ALW | 2 | 2005 | 1 | 2.80E+07 | 0.14637 | 0.079281108 | 0.88889 | 17.77 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0.249 | 9 | 0.01117 | 0.13438 | 0.05859 | 1 | 0 | 0 | -0.1522 |
| ALW | 2 | 2006 | 1 | 2.90E+07 | 0.31314 | 0.183241975 | 0.88889 | 17.71 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0.3617 | 9 | 0.00583 | -0.05154 | 0.06184 | 1 | 0 | 0 | 0.3396 |
| ALW | 2 | 2007 | 1 | 4.60E+07 | 0.33924 | 0.297426817 | 0.88889 | 17.77 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0.249 | 9 | -0.15275 | 0.05628 | 0.85541 | 1 | 0 | 0 | -0.557 |
| ALW | 2 | 2008 | 1 | 7.10E+07 | 0.04367 | 0.054130975 | 0.85714 | 17.86 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.3617 | 7 | -0.06466 | 0.09822 | 0.68482 | 1 | 1 | 1 | 0.3191 |
| ALW | 2 | 2009 | 1 | 6.00E+07 | 0.12146 | 0.024 | 0.85714 | 17.35 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.249 | 7 | -0.11305 | -0.40009 | 0.74846 | 1 | 1 | 1 | 0.0595 |
| ALW | 2 | 2010 | 1 | 5.50E+07 | 0.08929 | 0.1122 | 0.83333 | 17.04 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0.249 | 6 | -0.1234 | -0.26565 | 0.5064 | 1 | 1 | 1 | -0.1333 |
| ALW | 2 | 2011 | 1 | 5.40E+07 | 0.17444 | 0.189806138 | 0.83333 | 17.72 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0.249 | 6 | -0.06273 | 0.97544 | 0.55843 | 1 | 1 | 1 | 0.0392 |
| ALW | 2 | 2012 | 1 | 7.40E+07 | 0.1964 | 0.2201 | 0.83333 | 17.72 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0.249 | 6 | -0.04788 | -0.0007 | 0.71007 | 1 | 1 | 1 | 0.0738 |
| ALW | 2 | 2013 | 1 | 1.30E+08 | 0.02281 | 0.050636325 | 0.85714 | 17.88 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0.249 | 7 | -0.02062 | 0.16797 | 0.48301 | 1 | 1 | 1 | 0.0305 |
| AYR | 3 | 2006 | 1 | 5.90E+06 | 0.17485 | 0.12958438 | 0.57143 | 15.89 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0.5194 | 7 | 0.31693 | 0.08533 | 0.20094 | 0 | 0 | 0 | 0.0674 |
| AYR | 3 | 2007 | 1 | 8.70E+06 | 0.01697 | 0.1234 | 0.625 | 16.06 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.4064 | 8 | 0.24064 | 0.19195 | 0.16011 | 0 | 0 | 1 | 0.1495 |
| AYR | 3 | 2008 | 1 | 1.00E+07 | 0.09565 | 0.083969781 | 0.75 | 16.29 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.3267 | 8 | 0.20313 | 0.2554 | 0.10766 | 0 | 0 | 1 | 0.0306 |
| AYR | 3 | 2009 | 1 | 1.30E+07 | 0.00772 | 0.006330356 | 0.8 | 16.56 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0.3267 | 5 | 0.27252 | 0.30338 | 0.07733 | 0 | 0 | 1 | 0.2198 |
| AYR | 3 | 2010 | 1 | 1.60E+07 | 0.11631 | 0.153679033 | 0.8 | 16.34 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0.3267 | 5 | 0.18261 | -0.19712 | 0.11771 | 0 | 0 | 1 | 0.1429 |
| AYR | 3 | 2011 | 1 | 1.90E+07 | 0.07634 | 0.07402337 | 0.8 | 16.81 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0.7814 | 5 | 0.17415 | 0.60995 | 0.1248 | 0 | 0 | 1 | 0.05 |
| AYR | 3 | 2012 | 1 | 2.20E+07 | 0.04501 | 0.042337228 | 0.8 | 16.95 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0.7814 | 5 | 0.12725 | 0.14679 | 0.10795 | 1 | 0 | 1 | 0.0247 |
| AYR | 3 | 2013 | 1 | 2.30E+07 | 0.07581 | 0.073483572 | 0.8 | 17 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0.7814 | 5 | 0.01575 | 0.047 | 0.17325 | 1 | 0 | 1 | 0.108 |
| BOPP | 4 | 2004 | 1 | 1.30E+07 | 0.09494 | 0.147239741 | 0.77778 | 15.92 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0.5845 | 9 | 0.03805 | 0.10106 | 0.10553 | 1 | 0 | 0 | -0.0022 |
| BOPP | 4 | 2005 | 1 | 1.20E+07 | 0.01498 | 0.334 | 0.77778 | 15.81 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0.5845 | 9 | 0.0012 | -0.10522 | 0.07323 | 1 | 0 | 0 | 0.0796 |
| BOPP | 4 | 2006 | 1 | 1.20E+07 | 0.04007 | 0.25733 | 0.77778 | 16.02 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0.5845 | 9 | 0.4316 | 0.23986 | 0.09221 | 1 | 0 | 0 | 0.0657 |
| BOPP | 4 | 2007 | 1 | 1.80E+07 | 0.02376 | 0.032153588 | 0.75 | 16.39 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0.5845 | 8 | 0.06095 | 0.44451 | 0.06147 | 1 | 0 | 1 | 0.1141 |
| BOPP | 4 | 2008 | 1 | 2.20E+07 | 0.04107 | 0.043684224 | 0.77778 | 16.84 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0.5845 | 9 | 0.27799 | 0.56988 | 0.08741 | 1 | 0 | 1 | 0.1718 |
| BOPP | 4 | 2009 | 1 | 2.20E+07 | 0.03467 | 0.049238178 | 0.77778 | 16.56 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0.5845 | 9 | 0.07544 | -0.24217 | 0.08394 | 1 | 0 | 1 | 0.0781 |
| BOPP | 4 | 2010 | 1 | 2.40E+07 | 0.04914 | 0.060598698 | 0.75 | 16.78 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0.5845 | 8 | 0.1204 | 0.24117 | 0.08671 | 1 | 0 | 1 | 0.1422 |
| BOPP | 4 | 2011 | 1 | 3.20E+07 | 0.0479 | 0.043378645 | 0.83333 | 17.37 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0.7663 | 6 | 0.40131 | 0.79681 | 0.06293 | 1 | 0 | 1 | 0.3656 |
| BOPP | 4 | 2012 | 1 | 4.30E+07 | 0.01862 | 0.019727487 | 0.83333 | 17.53 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0.7663 | 6 | 0.42541 | 0.17364 | 0.06301 | 1 | 0 | 1 | 0.3519 |
| BOPP | 4 | 2013 | 1 | 4.60E+07 | 0.02693 | 0.034897261 | 0.83333 | 17.38 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0.7663 | 6 | 0.13421 | -0.13225 | 0.0493 | 1 | 0 | 1 | 0.1033 |
| CFAO | 5 | 2007 | 2 | 1.80E+07 | 0.02752 | 0.01423659 | 0.83333 | 17.34 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0.8821 | 6 | 0.1648 | 0.32858 | 0.72491 | 1 | 0 | 1 | 0.1599 |
| CFAO | 5 | 2008 | 2 | 2.80E+07 | 0.09963 | 0.057086131 | 0.85714 | 17.72 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0.8907 | 7 | 0.16522 | 0.46288 | 0.73606 | 1 | 0 | 1 | -0.0797 |
| CFAO | 5 | 2009 | 2 | 3.00E+07 | 0.0332 | 0.016104213 | 0.85714 | 17.93 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0.8907 | 7 | 0.13785 | 0.23245 | 0.61492 | 1 | 0 | 1 | 0.147 |
| CFAO | 5 | 2010 | 2 | 3.80E+07 | 0.05184 | 0.028812261 | 0.85714 | 18.03 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0.9406 | 7 | 0.9406 | 0.10859 | 0.62274 | 1 | 0 | 1 | 0.1438 |
| CFAO | 5 | 2011 | 2 | 4.70E+07 | 0.12863 | 0.059855068 | 0.83333 | 18.43 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0.9422 | 6 | 0.15918 | 0.48824 | 0.56951 | 1 | 0 | 1 | -0.0164 |
| CLYD | 6 | 2004 | 2 | 1.10E+06 | 0.256 | 0.221386036 | 0.6 | 14.07 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0.6103 | 5 | 0.31971 | 0.43526 | 0.20491 | 0 | 0 | 0 | -0.3549 |
| CLYD | 6 | 2005 | 2 | 1.70E+06 | 0.10892 | 0.102565794 | 0.83333 | 14.43 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0.6103 | 6 | 0.14975 | 0.43917 | 0.45456 | 0 | 0 | 0 | 0.2681 |
| CLYD | 6 | 2006 | 2 | 1.30E+06 | 0.11893 | 0.2411 | 0.85714 | 14.56 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0.6103 | 7 | 0.08944 | 0.13943 | 0.64621 | 0 | 0 | 0 | 0.161 |
| CLYD | 6 | 2007 | 2 | 1.50E+06 | 0.07012 | 0.15652 | 0.85714 | 13.9 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0.5997 | 7 | -0.23378 | -0.48139 | 0.60137 | 0 | 0 | 0 | 0.0726 |
| CLYD | 6 | 2008 | 2 | 1.30E+06 | 0.1484 | 0.13726165 | 0.75 | 14.19 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0.5997 | 4 | -0.12918 | 0.33081 | 0.8214 | 0 | 1 | 1 | -0.1347 |
| CLYD | 6 | 2009 | 2 | 2.00E+06 | 0.10134 | 0.095364386 | 0.8 | 14.55 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0.5997 | 5 | -0.00847 | 0.44092 | 0.88395 | 0 | 1 | 1 | -0.0515 |
| CLYD | 6 | 2010 | 2 | 1.80E+06 | 0.01582 | 0.01963629 | 0.75 | 14.19 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0.5997 | 4 | 0.03536 | -0.304 | 0.83452 | 0 | 1 | 1 | 0.2602 |
| CLYD | 6 | 2011 | 2 | 1.90E+06 | 0.02021 | 0.0404391 | 0.66667 | 13.76 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0.5997 | 3 | 0.0143 | -0.34745 | 0.82966 | 0 | 0 | 1 | 0.0788 |
| CMT | 7 | 2004 | 1 | 1.10E+06 | 0.11344 | 0.102310969 | 0.77778 | 13.99 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0.4432 | 9 | 0.07516 | 0.43053 | 0.73053 | 0 | 0 | 0 | 0.2101 |
| CMT | 7 | 2005 | 1 | 1.30E+06 | 0.3697 | 0.323899901 | 0.77778 | 14.2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0.4432 | 9 | 0.01237 | 0.23857 | 0.79485 | 0 | 0 | 0 | -0.0504 |
| CMT | 7 | 2006 | 1 | 3.80E+06 | 0.16552 | 0.187048469 | 0.71429 | 15.03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.4432 | 7 | 0.02475 | 1.30124 | 0.7299 | 0 | 0 | 0 | -0.0318 |
| CMT | 7 | 2007 | 1 | 3.50E+06 | 0.27597 | 0.287413368 | 0.71429 | 15.03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.4432 | 7 | 0.00625 | -0.40229 | 0.8906 | 0 | 0 | 1 | 0.1279 |
| CMT | 7 | 2008 | 1 | 3.30E+06 | 0.07314 | 0.092709823 | 0.85714 | 14.76 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.4432 | 7 | 0.03771 | 0.27087 | 0.84022 | 1 | 0 | 1 | 0.1278 |
| CMT | 7 | 2009 | 1 | 3.60E+06 | 0.12939 | 0.144044428 | 0.85714 | 15 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.4432 | 7 | 0.01753 | 0.27522 | 0.80173 | 1 | 0 | 1 | -0.0079 |
| CMT | 7 | 2010 | 1 | 4.00E+06 | 0.24801 | 0.226409861 | 0.875 | 15.29 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.4666 | 8 | 0.05585 | 0.18617 | 0.77389 | 1 | 0 | 1 | 0.1329 |
| CMT | 7 | 2011 | 1 | 4.70E+06 | 0.01829 | 0.019575337 | 0.75 | 15.29 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.4666 | 8 | 0.05394 | 0.13003 | 0.77423 | 1 | 0 | 1 | 0.1368 |
| CMT | 7 | 2012 | 1 | 4.90E+06 | 0.12485 | 0.138874752 | 0.6 | 15.31 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.4666 | 5 | 0.0484 | 0.01225 | 0.61979 | 1 | 0 | 1 | 0.1422 |
| CMT | 7 | 2013 | 1 | 4.70E+06 | 0.26384 | 0.082991 | 0.83333 | 15.21 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.4666 | 6 | -0.13676 | -0.09422 | 0.84563 | 1 | 0 | 1 | 0.0353 |
| CPC | 8 | 2004 | 3 | 5.20E+07 | 0.02303 | 0.034780132 | 0.8 | 17.35 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0.84 | 10 | 0.00958 | -0.00664 | 0.68917 | 0 | 0 | 0 | 0.0043 |
| CPC | 8 | 2005 | 3 | 6.60E+07 | 0.09083 | 0.215688626 | 0.9 | 17.15 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.84 | 10 | 0.01433 | -0.18286 | 0.75541 | 0 | 0 | 0 | 0.1338 |
| CPC | 8 | 2006 | 3 | 7.90E+07 | 0.08968 | 0.245300231 | 0.9 | 17.18 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.84 | 10 | 0.01197 | 0.03859 | 0.78989 | 0 | 0 | 0 | 0.1316 |
| CPC | 8 | 2007 | 3 | 1.10E+08 | 0.31398 | 0.1022 | 0.9 | 17.69 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.8747 | 10 | 0.00815 | 0.66017 | 0.70684 | 0 | 0 | 0 | -0.2918 |

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| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CPC | 8 | 2008 | 3 | 1.80E+08 | 0.11768 | 0.08991 | 0.9 | 17.9 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.889 | 10 | 0.01194 | 0.2318 | 0.53829 | 0 | 0 | 1 | -0.1293 |
| CPC | 8 | 2009 | 3 | 2.00E+08 | 0.05193 | 0.12452 | 0.91667 | 17.63 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.889 | 12 | -0.16916 | -0.23323 | 0.87262 | 1 | 0 | 1 | -0.1046 |
| CPC | 8 | 2010 | 3 | 1.90E+08 | 0.19287 | 0.0132 | 0.91667 | 18.25 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.889 | 12 | -0.06367 | 0.84728 | 0.99917 | 1 | 1 | 1 | 0.073 |
| CPC | 8 | 2011 | 3 | 2.00E+08 | 0.0904 | 0.205214996 | 0.91667 | 18.31 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.889 | 12 | -0.06854 | 0.05987 | 0.98217 | 1 | 1 | 1 | 0.1495 |
| CPC | 8 | 2012 | 3 | 1.30E+08 | 0.11109 | 0.01223 | 0.91667 | 17.83 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.94 | 12 | -0.05062 | 0.23685 | 0.99628 | 1 | 1 | 1 | 0.1294 |
| CPC | 8 | 2013 | 3 | 1.60E+08 | 0.04252 | 0.0241 | 0.91667 | 17.91 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.94 | 12 | -0.08808 | 0.36436 | 0.82491 | 1 | 1 | 1 | 0.2356 |
| FML | 9 | 2004 | 3 | 1.00E+07 | 0.00072 | 0.08 | 0.85714 | 17.06 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.374 | 7 | 0.37857 | 0.51225 | 0.50486 | 1 | 0 | 0 | 0.6503 |
| FML | 9 | 2005 | 3 | 1.60E+07 | 0.039 | 0.01971896 | 0.85714 | 17.26 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.374 | 7 | 0.29592 | 0.22358 | 0.45409 | 1 | 0 | 0 | 0.3828 |
| FML | 9 | 2006 | 3 | 1.80E+07 | 0.00982 | 0.156 | 0.85714 | 17.29 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.374 | 7 | 0.20728 | 0.03611 | 0.39941 | 1 | 0 | 0 | 0.3965 |
| FML | 9 | 2007 | 3 | 2.40E+07 | 0.06285 | 0.096279794 | 0.85714 | 17.53 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.3723 | 7 | 0.23796 | 0.26852 | 0.34644 | 1 | 0 | 1 | 0.3931 |
| FML | 9 | 2008 | 3 | 3.30E+07 | 0.03481 | 0.040780875 | 0.85714 | 17.82 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0.5545 | 7 | 0.29753 | 0.34024 | 0.34841 | 1 | 0 | 1 | 0.5068 |
| FML | 9 | 2009 | 3 | 5.10E+07 | 0.00354 | 0.002192227 | 0.85714 | 18.23 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0.5562 | 7 | 0.46126 | 0.49836 | 0.31365 | 1 | 0 | 1 | 0.6249 |
| FML | 9 | 2010 | 3 | 6.80E+07 | 0.02358 | 0.025540352 | 0.85714 | 18.46 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0.5565 | 7 | 0.37896 | 0.25832 | 0.23782 | 1 | 0 | 1 | 0.4567 |
| FML | 9 | 2011 | 3 | 8.30E+07 | 0.01911 | 0.014526479 | 0.85714 | 18.51 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0.5664 | 7 | 0.27517 | 0.05305 | 0.24926 | 1 | 0 | 1 | 0.391 |
| FML | 9 | 2012 | 3 | 9.70E+07 | 0.07009 | 0.045972695 | 0.85714 | 18.81 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0.5664 | 7 | 0.32737 | 0.34711 | 0.36117 | 1 | 0 | 1 | 0.4196 |
| FML | 9 | 2013 | 3 | 1.00E+08 | 0.11734 | 0.085492017 | 0.875 | 18.75 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0.5664 | 8 | 0.22497 | -0.05599 | 0.2451 | 1 | 0 | 1 | 0.2808 |
| GGBL | 10 | 2004 | 3 | 4.60E+07 | 0.07511 | 0.065498658 | 0.55556 | 17.78 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0.6037 | 9 | 0.22881 | 0.45606 | 0.70693 | 1 | 0 | 0 | 0.2445 |
| GGBL | 10 | 2005 | 3 | 1.00E+08 | 0.00118 | 0.001475297 | 0.58333 | 18.2 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0.5044 | 12 | 0.23495 | 0.52041 | 0.56274 | 1 | 0 | 0 | 0.3073 |
| GGBL | 10 | 2006 | 3 | 1.20E+08 | 0.12952 | 0.148693362 | 0.75 | 18.47 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0.51 | 12 | 0.14976 | 0.30692 | 0.56816 | 1 | 0 | 0 | 0.0511 |
| GGBL | 10 | 2007 | 3 | 1.30E+08 | 0.01893 | 0.088374617 | 0.75 | 18.62 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0.51 | 12 | 0.1165 | 0.16849 | 0.56784 | 1 | 0 | 0 | 0.0374 |
| GGBL | 10 | 2008 | 3 | 1.80E+08 | 0.08604 | 0.069393236 | 0.75 | 18.92 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0.51 | 12 | 0.12624 | 0.34335 | 0.70302 | 1 | 0 | 1 | 0.3183 |
| GGBL | 10 | 2009 | 3 | 2.10E+08 | 0.01081 | 0.01421104 | 0.75 | 19.12 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0.51 | 12 | 0.08622 | 0.22213 | 0.69974 | 1 | 0 | 1 | 0.2573 |
| GGBL | 10 | 2010 | 3 | 1.90E+08 | 0.03938 | 0.036048927 | 0.72727 | 19.15 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0.51 | 11 | -0.02185 | 0.02752 | 0.7611 | 1 | 0 | 1 | -0.1022 |
| GGBL | 10 | 2011 | 3 | 2.00E+08 | 0.17672 | 0.147711681 | 0.72727 | 19.31 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0.51 | 11 | 0.00282 | 0.18302 | 0.77621 | 1 | 1 | 1 | 0.3258 |
| GGBL | 10 | 2012 | 3 | 2.40E+08 | 0.15304 | 0.127795889 | 0.81818 | 19.49 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0.5242 | 11 | 0.12246 | 0.19659 | 0.43074 | 1 | 0 | 1 | 0.141 |
| GGBL | 10 | 2013 | 3 | 3.00E+08 | 0.05209 | 0.088355247 | 0.72727 | 19.59 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0.5242 | 11 | 0.07488 | 0.09818 | 0.48723 | 1 | 0 | 1 | 0.1665 |
| GOIL | 11 | 2006 | 2 | 5.90E+07 | 0.01172 | 0.023574288 | 0.875 | 19.07 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.6981 | 8 | 0.051 | 0.39166 | 0.76669 | 1 | 0 | 0 | -0.0036 |
| GOIL | 11 | 2007 | 2 | 8.10E+07 | 0.05917 | 0.015707231 | 0.88889 | 19.54 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.6981 | 9 | 0.06899 | 0.59499 | 0.72837 | 1 | 0 | 0 | 0.0608 |
| GOIL | 11 | 2008 | 2 | 1.00E+08 | 0.13278 | 0.030182581 | 0.88889 | 19.9 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.6981 | 9 | 0.05232 | 0.43189 | 0.74293 | 1 | 0 | 1 | 0.172 |
| GOIL | 11 | 2009 | 2 | 1.00E+08 | 0.0723 | 0.017101331 | 0.88889 | 19.86 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.6974 | 9 | 0.0528 | -0.03947 | 0.70905 | 1 | 0 | 1 | 0.1994 |
| GOIL | 11 | 2010 | 2 | 1.00E+08 | 0.01239 | 0.002716715 | 0.88889 | 19.97 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.7017 | 9 | 0.06338 | 0.12051 | 0.67695 | 1 | 0 | 1 | 0.1179 |
| GOIL | 11 | 2011 | 2 | 1.20E+08 | 0.05222 | 0.010415657 | 0.875 | 20.23 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.7017 | 8 | 0.07619 | 0.28999 | 0.66964 | 1 | 0 | 1 | 0.1741 |
| GOIL | 11 | 2012 | 2 | 1.50E+08 | 0.00223 | 0.000432057 | 0.88889 | 20.49 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.8979 | 9 | 0.07736 | 0.29871 | 0.7624 | 1 | 0 | 1 | 0.1277 |
| GOIL | 11 | 2013 | 2 | 2.20E+08 | 0.18002 | 0.039729881 | 0.88889 | 20.73 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.6974 | 9 | 0.08982 | 0.27081 | 0.73266 | 1 | 0 | 1 | 0.3717 |
| GWEB | 12 | 2006 | 1 | 1.60E+06 | 0.07587 | 0.174973133 | 0.71429 | 13.42 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0.5075 | 7 | 0.02673 | 0.22396 | 0.30237 | 0 | 1 | 0 | 0.091 |
| GWEB | 12 | 2007 | 1 | 1.70E+06 | 0.01334 | 0.037741315 | 0.71429 | 13.28 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0.5075 | 7 | -0.17532 | -0.13531 | 0.56893 | 0 | 0 | 0 | -0.132 |
| GWEB | 12 | 2008 | 1 | 1.70E+06 | 0.03984 | 0.127218397 | 0.71429 | 13.18 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.4575 | 7 | -0.20508 | -0.09071 | 0.7799 | 0 | 1 | 1 | -0.1592 |
| GWEB | 12 | 2009 | 1 | 1.90E+06 | 0.07576 | 0.08721 | 0.6 | 12.49 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.4575 | 5 | -0.24247 | -0.49983 | 1.07826 | 0 | 1 | 1 | -0.0811 |
| GWEB | 12 | 2010 | 1 | 2.60E+06 | 0.24148 | 0.143973126 | 0.6 | 14.06 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0.5075 | 5 | -0.27837 | 3.79492 | 1.25946 | 0 | 1 | 1 | -0.402 |
| GWEB | 12 | 2011 | 1 | 1.70E+06 | 0.21028 | 0.186772071 | 0.71429 | 14.49 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0.5075 | 7 | -0.23326 | 0.53152 | 2.0323 | 0 | 1 | 1 | -0.22 |
| GWEB | 12 | 2012 | 1 | 1.50E+06 | 0.01587 | 0.015197748 | 0.71429 | 14.27 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0.5075 | 7 | -0.23384 | -0.19293 | 2.45514 | 0 | 1 | 1 | 0.083 |
| MLC | 13 | 2004 | 2 | 1.30E+07 | 0.04162 | 0.046178078 | 0.85714 | 16.3 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.2191 | 7 | 0.04984 | 0.30459 | 0.46794 | 1 | 0 | 0 | -0.0131 |
| MLC | 13 | 2005 | 2 | 1.50E+07 | 0.0698 | 0.093235526 | 0.875 | 16.23 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0.2191 | 8 | 0.05973 | -0.07183 | 0.4838 | 1 | 0 | 0 | -0.0124 |
| MLC | 13 | 2006 | 2 | 1.60E+07 | 0.02059 | 0.02570976 | 0.875 | 16.34 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.2191 | 7 | 0.0503 | 0.12096 | 0.47226 | 1 | 0 | 0 | 0.064 |
| MLC | 13 | 2007 | 2 | 2.20E+07 | 0.13227 | 0.13542607 | 0.85714 | 16.89 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.2191 | 7 | 0.07312 | 0.73274 | 0.42557 | 1 | 0 | 0 | 0.1044 |
| MLC | 13 | 2008 | 2 | 2.90E+07 | 0.02011 | 0.022665268 | 0.85714 | 17.07 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.2191 | 7 | 0.06673 | 0.19296 | 0.53622 | 1 | 0 | 1 | 0.0259 |
| MLC | 13 | 2009 | 2 | 2.80E+07 | 0.00406 | 0.005193471 | 0.85714 | 16.91 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.2191 | 7 | 0.03498 | -0.14415 | 0.49696 | 1 | 0 | 1 | 0.0582 |
| MLC | 13 | 2010 | 2 | 2.70E+07 | 0.11942 | 0.113104878 | 0.85714 | 17.16 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.2411 | 7 | 0.05135 | 0.28395 | 0.45843 | 1 | 0 | 1 | 0.0863 |
| MLC | 13 | 2011 | 2 | 3.50E+07 | 0.03864 | 0.040319329 | 0.85714 | 17.34 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.2411 | 7 | 0.11821 | 0.19011 | 0.50531 | 1 | 0 | 1 | 0.0881 |
| MLC | 13 | 2012 | 2 | 8.20E+07 | 0.08736 | 0.151977848 | 0.85714 | 17.66 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.2856 | 7 | 0.17587 | 0.38644 | 0.50814 | 1 | 0 | 1 | 0.279 |
| MLC | 13 | 2013 | 2 | 7.80E+07 | 0.05973 | 0.121891009 | 0.875 | 17.46 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0.2999 | 8 | | -0.1819 | 0.51018 | 1 | 0 | 1 | 0.0733 |
| PBC | 14 | 2004 | 2 | 3.20E+07 | 0.43995 | 0.360633722 | 0.88889 | 19.25 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.5669 | 9 | 0.31545 | 0.43983 | 0.73063 | 0 | 0 | 0 | -0.3623 |
| PBC | 14 | 2005 | 2 | 3.00E+07 | 0.0789 | 0.010348949 | 0.88889 | 19.26 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.5669 | 9 | -0.09842 | 0.0032 | 0.82224 | 0 | 0 | 0 | 0.1478 |
| PBC | 14 | 2006 | 2 | 1.90E+07 | 0.96788 | 0.873832991 | 0.88889 | 19.33 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.8176 | 9 | -0.03634 | 0.08048 | 0.77494 | 0 | 1 | 0 | 0.5709 |
| PBC | 14 | 2007 | 2 | 3.10E+07 | 0.4539 | 0.271975259 | 0.9 | 19.09 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.7479 | 10 | 0.02371 | -0.2163 | 1.00393 | 0 | 1 | 0 | 0.3976 |
| PBC | 14 | 2008 | 2 | 6.70E+07 | 0.27658 | 0.176015723 | 0.88889 | 19.32 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.7479 | 9 | 0.06821 | 0.25814 | 0.89101 | 0 | 0 | 1 | -0.2617 |
| PBC | 14 | 2009 | 2 | 9.70E+07 | 0.20365 | 0.144957979 | 0.90909 | 19.9 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.7479 | 11 | 0.07705 | 0.78185 | 0.88281 | 0 | 0 | 1 | 0.2242 |
| PBC | 14 | 2010 | 2 | 1.70E+08 | 0.34737 | 0.192774586 | 0.90909 | 20.27 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.7479 | 11 | 0.14615 | 0.44695 | 0.86024 | 0 | 0 | 1 | 0.384 |
| PBC | 14 | 2011 | 2 | 2.70E+08 | 0.30281 | 0.163853503 | 0.90909 | 20.99 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.7479 | 11 | 0.16569 | 1.05561 | 0.82732 | 0 | 0 | 1 | 0.1754 |
| PBC | 14 | 2012 | 2 | 2.90E+08 | 0.21969 | 0.054647816 | 0.90909 | 20.87 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.7479 | 11 | 0.03672 | -0.10613 | 0.8309 | 0 | 0 | 1 | 0.0909 |
| PBC | 14 | 2013 | 2 | 3.00E+08 | 0.22883 | 0.066581604 | 0.90909 | 20.84 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0.7479 | 11 | -0.03053 | -0.03413 | 0.87907 | 0 | 0 | 1 | 0.4242 |
| PKL | 15 | 2004 | 1 | 2.80E+06 | 0.00388 | 0.004109026 | 0.875 | 14.78 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0.5518 | 8 | 0.07082 | 0.28925 | 0.21131 | 1 | 0 | 0 | -0.5216 |
| PKL | 15 | 2005 | 1 | 2.60E+06 | 0.02166 | 0.025749954 | 0.875 | 14.61 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0.5518 | 8 | -0.15921 | -0.15263 | 0.37525 | 1 | 0 | 0 | -0.061 |
| PKL | 15 | 2006 | 1 | 2.60E+06 | 0.00648 | 0.008389339 | 0.875 | 14.66 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0.5518 | 8 | -0.09657 | 0.05004 | 0.58208 | 1 | 1 | 0 | -0.119 |
| PKL | 15 | 2007 | 1 | 3.10E+06 | 0.09541 | 0.091311234 | 0.875 | 14.98 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0.5536 | 8 | -0.08773 | 0.37404 | 0.70589 | 1 | 1 | 0 | -0.0441 |
| PKL | 15 | 2008 | 1 | 2.40E+06 | 0.13352 | 0.112247005 | 0.875 | 14.87 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0.3863 | 8 | -0.12489 | -0.09896 | 0.45517 | 1 | 1 | 1 | 0.0255 |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PKL | 15 | 2009 | 1 | 2.10E+06 | 0.0886 | 0.086267883 | 0.875 | 14.59 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0.3863 | 8 | -0.13422 | -0.24746 | 0.52904 | 1 | 1 | 1 | -0.0066 |
| PKL | 15 | 2010 | 1 | 1.70E+06 | 0.28945 | 0.286567542 | 0.85714 | 14.36 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.3863 | 7 | -0.29842 | -0.20511 | 0.91369 | 1 | 1 | 1 | 0.0252 |
| PKL | 15 | 2011 | 1 | 1.60E+06 | 0.08519 | 0.061263662 | 0.85714 | 14.6 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0.3863 | 7 | -0.29217 | -0.27894 | 1.08471 | 1 | 1 | 1 | 0.0263 |
| PKL | 15 | 2012 | 1 | 2.10E+06 | 0.20918 | 0.158371291 | 0.85714 | 14.01 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.3855 | 7 | -0.43957 | -0.44959 | 1.82063 | 1 | 1 | 1 | -0.0416 |
| PZ | 16 | 2004 | 1 | 1.90E+07 | 0.04793 | 0.0516743 | 0.8 | 16.67 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0.903 | 5 | 0.12556 | 0.16195 | 0.33662 | 1 | 0 | 0 | 0.3248 |
| PZ | 16 | 2005 | 1 | 1.90E+07 | 0.21627 | 0.247655489 | 0.8 | 16.79 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0.903 | 5 | 0.05346 | 0.12746 | 0.29202 | 1 | 0 | 0 | 0.065 |
| PZ | 16 | 2006 | 1 | 2.40E+07 | 0.19986 | 0.176965406 | 0.8 | 16.92 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0.903 | 5 | 0.11877 | 0.14176 | 0.39221 | 1 | 0 | 0 | 0.106 |
| PZ | 16 | 2007 | 1 | 2.90E+07 | 0.02157 | 0.021521938 | 0.83333 | 17.19 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0.903 | 6 | 0.14 | 0.30182 | 0.38918 | 1 | 0 | 1 | -0.0051 |
| PZ | 16 | 2008 | 1 | 3.80E+07 | 0.11944 | 0.107110447 | 0.83333 | 17.57 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0.903 | 6 | 0.12068 | 0.46844 | 0.45332 | 1 | 0 | 1 | -0.0601 |
| PZ | 16 | 2009 | 1 | 3.80E+07 | 0.15248 | 0.131248691 | 0.71429 | 17.61 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0.903 | 7 | 0.02182 | 0.04367 | 0.44194 | 1 | 0 | 1 | 0.1549 |
| PZ | 16 | 2010 | 1 | 4.20E+07 | 0.01079 | 0.008253296 | 0.57143 | 17.82 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0.903 | 7 | 0.0994 | 0.22766 | 0.3973 | 1 | 0 | 1 | 0.061 |
| PZ | 16 | 2011 | 1 | 5.70E+07 | 0.08338 | 0.071741828 | 0.33333 | 18.01 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0.903 | 6 | 0.15964 | 0.20759 | 0.45216 | 1 | 0 | 1 | -0.0062 |
| PZ | 16 | 2012 | 1 | 6.20E+07 | 0.09398 | 0.071099991 | 0.33333 | 18.23 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0.903 | 6 | 0.14801 | 0.24384 | 0.49697 | 1 | 0 | 1 | 0.133 |
| PZ | 16 | 2013 | 1 | 7.30E+07 | 0.09225 | 0.070244096 | 0.33333 | 18.38 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0.903 | 6 | 0.13395 | 0.16301 | 0.46248 | 1 | 0 | 1 | 0.0021 |
| SPL | 17 | 2004 | 1 | 2.70E+06 | 0.09122 | 0.16720383 | 0.85714 | 14.19 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.2727 | 7 | 0.01403 | 0.17591 | 0.23795 | 1 | 0 | 0 | -0.3065 |
| SPL | 17 | 2005 | 1 | 2.30E+06 | 0.04764 | 0.066958958 | 0.85714 | 14.32 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.2727 | 7 | 0.08651 | 0.1326 | 0.13671 | 1 | 0 | 0 | 0.0389 |
| SPL | 17 | 2006 | 1 | 3.10E+06 | 0.05241 | 0.086364858 | 0.85714 | 14.46 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.273 | 7 | 0.03745 | 0.14698 | 0.32414 | 1 | 0 | 0 | -0.007 |
| SPL | 17 | 2007 | 1 | 3.40E+06 | 0.08522 | 0.141027416 | 0.83333 | 14.53 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.273 | 6 | 0.00859 | 0.07362 | 0.36513 | 1 | 0 | 0 | 0.0362 |
| SPL | 17 | 2008 | 1 | 3.30E+06 | 0.17723 | 0.239869331 | 0.83333 | 14.72 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.273 | 6 | -0.03922 | 0.21187 | 0.42057 | 1 | 0 | 1 | 0.0279 |
| SPL | 17 | 2009 | 1 | 3.70E+06 | 0.04854 | 0.058815427 | 0.83333 | 14.94 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.273 | 6 | -0.04624 | 0.25005 | 0.52355 | 1 | 1 | 1 | -0.1198 |
| SPL | 17 | 2010 | 1 | 3.70E+06 | 0.05793 | 0.057627582 | 0.83333 | 15.14 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.273 | 6 | 0.02222 | 0.21911 | 0.50183 | 1 | 1 | 1 | 0.0034 |
| SPL | 17 | 2011 | 1 | 3.70E+06 | 0.28897 | 0.253902404 | 0.83333 | 15.26 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.273 | 6 | 0.12752 | 0.12876 | 0.37237 | 1 | 0 | 1 | 0.3891 |
| SPL | 17 | 2012 | 1 | 4.40E+06 | 0.05381 | 0.049793273 | 0.85714 | 15.39 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.273 | 7 | 0.08022 | 0.13258 | 0.43074 | 1 | 0 | 1 | 0.021 |
| SPL | 17 | 2013 | 1 | 5.20E+06 | 0.0558 | 0.043404698 | 0.85714 | 15.71 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.273 | 7 | 0.11591 | 0.38871 | 0.41705 | 1 | 0 | 1 | 0.0682 |
| SWL | 18 | 2004 | 1 | 418387 | 0.08078 | 0.194132008 | 0.85714 | 12.07 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0.2932 | 7 | -0.19191 | 0.13391 | 0.60295 | 0 | 0 | 0 | -0.1405 |
| SWL | 18 | 2005 | 1 | 1.80E+06 | 0.63194 | 0.626128064 | 0.85714 | 14.41 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.2932 | 7 | 0.37761 | 9.4796 | 0.86224 | 0 | 1 | 0 | 0.0945 |
| SWL | 18 | 2006 | 1 | 733523 | 0.04165 | 0.017664946 | 0.85714 | 14.36 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0.3935 | 7 | 0.1095 | -0.05011 | 0.50285 | 0 | 0 | 0 | 0.2068 |
| SWL | 18 | 2007 | 1 | 898513 | 0.20469 | 0.245896994 | 0.85714 | 13.52 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0.2932 | 7 | 0.18214 | -0.56777 | 0.54333 | 0 | 0 | 0 | 0.2672 |
| SWL | 18 | 2008 | 1 | 1.70E+06 | 0.01154 | 0.008465279 | 0.85714 | 14.63 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0.2932 | 7 | 0.20531 | 2.01351 | 0.6432 | 0 | 0 | 1 | -0.3298 |
| SWL | 18 | 2009 | 1 | 2.10E+06 | 0.02659 | 0.020368925 | 0.85714 | 14.8 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0.2932 | 7 | 0.18975 | 0.19373 | 0.61681 | 0 | 0 | 1 | 0.1977 |
| SWL | 18 | 2010 | 1 | 953587 | 0.24147 | 0.146918467 | 0.85714 | 12.95 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0.2932 | 7 | -0.15851 | -0.84343 | 0.86341 | 0 | 0 | 1 | 0.2451 |
| SWL | 18 | 2011 | 1 | 1.20E+06 | 0.28894 | 0.234180767 | 0.85714 | 13.56 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.2932 | 7 | -0.09487 | 0.83421 | 0.84224 | 0 | 1 | 1 | -0.0456 |
| SWL | 18 | 2012 | 1 | 2.60E+06 | 0.62697 | 0.104295494 | 0.85714 | 14.91 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.2932 | 7 | 0.06743 | 2.87225 | 0.42302 | 0 | 1 | 1 | 1.7162 |
| SWL | 18 | 2013 | 1 | 5.40E+06 | 0.00254 | 0.001376389 | 0.85714 | 16.12 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.2932 | 7 | 0.11681 | 2.34941 | 0.89755 | 0 | 1 | 1 | 1.0962 |
| TOTAL | 19 | 2006 | 2 | 1.30E+08 | 0.03904 | 0.327675606 | 0.90909 | 19 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0.4362 | 11 | 0.14397 | 0.12878 | 0.5619 | 1 | 0 | | -0.5441 |
| TOTAL | 19 | 2007 | 2 | 1.40E+08 | 0.18132 | 0.061754303 | 0.90909 | 19.82 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0.4362 | 11 | 0.06478 | -0.01108 | 0.59752 | 1 | 0 | | 0.1347 |
| TOTAL | 19 | 2008 | 2 | 1.50E+08 | 0.06194 | 0.016198031 | 0.90909 | 20.16 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0.4362 | 11 | 0.04516 | 0.27473 | 0.62484 | 1 | 1 | | -0.0115 |
| TOTAL | 19 | 2009 | 2 | 1.40E+08 | 0.15111 | 0.040067633 | 0.9 | 20.11 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0.4362 | 10 | 0.08887 | 0.19511 | 0.58001 | 1 | 0 | 1 | 0.2707 |
| TOTAL | 19 | 2010 | 2 | 1.70E+08 | 0.02935 | 0.006946499 | 0.9 | 20.42 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0.4362 | 10 | 0.14632 | 0.18255 | 0.62148 | 1 | 0 | 1 | 0.2162 |
| TOTAL | 19 | 2011 | 2 | 2.30E+08 | 0.01964 | 0.004551756 | 0.88889 | 20.69 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0.4362 | 9 | 0.12901 | 0.20478 | 0.67766 | 1 | 0 | 1 | 0.2088 |
| TOTAL | 19 | 2012 | 2 | 2.90E+08 | 0.01093 | 0.002507218 | 0.88889 | 20.94 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0.4362 | 9 | 0.13552 | 0.10511 | 0.69833 | 1 | 0 | 1 | 0.2321 |
| TOTAL | 19 | 2013 | 2 | 3.50E+08 | 0.01594 | 0.004115151 | 0.88889 | 21.01 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0.4362 | 9 | 0.12809 | 0.07573 | 0.68304 | 1 | 0 | 1 | 0.1162 |
| TRANSOL | 20 | 2006 | 2 | 4.30E+06 | 0.47764 | 0.061986223 | 0.875 | 17.31 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0.67 | 8 | 0.3512 | -0.0806 | 0.23008 | 0 | 0 | 0 | -0.3671 |
| TRANSOL | 20 | 2007 | 2 | 4.90E+06 | 0.1711 | 0.022886499 | 0.875 | 17.41 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0.672 | 8 | 0.11767 | 0.21296 | 0.3163 | 0 | 0 | 0 | -0.0861 |
| TRANSOL | 20 | 2008 | 2 | 3.60E+06 | 0.10763 | 0.031676275 | 0.8 | 16.31 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0.675 | 5 | -0.31612 | -0.13553 | 0.53714 | 0 | 0 | 1 | 0.1846 |
| TRANSOL | 20 | 2009 | 2 | 2.70E+06 | 0.17245 | 0.062700485 | 0.8 | 15.81 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0.676 | 5 | -0.44672 | -0.39471 | 0.97841 | 0 | 1 | 1 | -0.1184 |
| UNIL | 21 | 2004 | 1 | 6.40E+07 | 0.0766 | 0.15509462 | 0.4 | 18.33 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.4201 | 10 | 0.11776 | 0.05362 | 0.46029 | 1 | 0 | 0 | 0.0453 |
| UNIL | 21 | 2005 | 1 | 6.20E+07 | 0.11676 | 0.269409001 | 0.5 | 18.3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.42 | 10 | 0.15601 | 0.27005 | 0.42642 | 1 | 0 | 0 | 0.0526 |
| UNIL | 21 | 2006 | 1 | 6.30E+07 | 0.05115 | 0.127003218 | 0.5 | 18.46 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.42 | 10 | 0.1439 | 0.18998 | 0.42711 | 1 | 0 | 0 | 0.1956 |
| UNIL | 21 | 2007 | 1 | 9.60E+07 | 0.05102 | 0.035072706 | 0.5 | 18.59 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.42 | 10 | 0.19844 | 0.18281 | 0.31103 | 1 | 0 | 1 | 0.2959 |
| UNIL | 21 | 2008 | 1 | 1.30E+08 | 0.00735 | 0.005744977 | 0.4 | 18.75 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.42 | 10 | 0.30547 | 0.13178 | 0.40522 | 1 | 0 | 1 | 0.2152 |
| UNIL | 21 | 2009 | 1 | 1.20E+08 | 0.12176 | 0.085056512 | 0.44444 | 18.93 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.42 | 9 | 0.03228 | 0.15058 | 0.4161 | 1 | 0 | 1 | 0.1256 |
| UNIL | 21 | 2010 | 1 | 1.40E+08 | 0.12316 | 0.094925266 | 0.5 | 18.94 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.42 | 10 | 0.19445 | 0.20336 | 0.45116 | 1 | 0 | 1 | 0.1649 |
| UNIL | 21 | 2011 | 1 | 1.60E+08 | 0.11699 | 0.076892445 | 0.5 | 19.01 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.42 | 10 | 0.25476 | 0.28663 | 0.51489 | 1 | 0 | 1 | 0.2169 |
| UNIL | 21 | 2012 | 1 | 1.50E+08 | 0.14094 | 0.076786145 | 0.55556 | 19.3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.42 | 9 | 0.10166 | 0.08495 | 0.79332 | 1 | 0 | 1 | 0.2826 |
| UNIL | 21 | 2013 | 1 | 1.90E+08 | 0.06315 | 0.03751738 | 0.44444 | 19.46 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.42 | 9 | 0.09155 | 0.14627 | 0.83017 | 1 | 0 | 1 | 0.0956 |