# EFFECT OF CORPORATE GOVERNANCE ON FINANCIAL REPORTING QUALITY AMONG NON-FINANCIAL LISTED FIRMS AT THE NAIROBI SECURITIES EXCHANGE, KENYA

#### **RIDWAN SHEIKH NOR**

A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF
MASTER OF BUSINESS ADMINISTRATION (FINANCE), FACULTY OF
BUSINESS AND MANAGEMENT SCIENCES, UNIVERSITY OF NAIROBI

#### **DECLARATION**

This research project is my original work that has never been presented in any University for a ward of a degree

Signature:

Date: 03/11/2022

Ridwan Sheikh Nor

D63/41340/2021

This research project is submitted with my approval as the University supervisor

Signature

Date: 03/11/2022

**Supervisor** 

Prof. Josiah Aduda

**University of Nairobi** 

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# LIST OF ABBREVIATIONS

NSE Nairobi Securities Exchange

CG Corporate Governance

FRQ Financial Reporting Quality

CMA Capital Market Authority

#### **ABSTRACT**

The study sought to establish the effect of corporate governance on financial reporting quality among non-financial listed firms at the Nairobi Securities Exchange, Kenya. The study adopted correlational research design while targeting 36 non-monetary listed entities on Nairobi Securities Exchange, Kenya. The study collected secondary from the Nairobi Securities Exchange print outs and the financial statements of the respective firms on a five year period ranging from 2017-2021. The analysis of the gathered evidence was executed through SPSS tool utilizing means and standard deviations as well as correlation and regression analysis and presented through tables. It was evident that audit quality ( $\beta$ =.443, p<0.05 & t>1.96) had the greatest significant effect on financial reporting quality a followed by firm leverage (β=.058, p<0.05 & t>1.96), board independence ( $\beta$ =.049, p<0.05 & t>1.96) and liquidity ( $\beta$ =.018, p<0.05 & t>1.96). The study concludes that corporate governance is a significant predictor of financial reporting quality. The study recommends the board of directors in the non-financial listed firms at the Nairobi Securities Exchange; Kenya should play a more effective oversight role to enhance the corporate governance mechanisms. The shareholders of the non-financial listed firms at the Nairobi Securities Exchange; Kenya should demand a more accountable and active role on the side of the management. The policy makers working in the non-financial listed firms at the Nairobi Securities Exchange; Kenya should formulate and implement sound policies in regard to corporate governance and financial reporting.

#### **CHAPTER ONE: INTRODUCTION**

#### 1.1 Background to the Study

Financial reporting quality informs the rationality of the decisions made by the stakeholders of the firm including the shareholders and lenders. Poor financial reports would negatively affect the financial decisions made by these parties which may in turn have ripple effect on the value of the firms (Wati, 2020). Corporate governance plays an instrumental role when it comes to financial reporting quality especially in reference to the audit board committee and the general attributes of the board including independence and composition. Poor corporate governance mechanism creates loopholes where the management can easily overstate financial reports to portray false impression that the firm is doing well so as to temporarily increase the value of the market share (Albawwat, Al-Hajaia & Al-Frijat, 2021). This therefore implies that a positive relationship is predicted between corporate governance and financial reporting quality.

The information asymmetry theory, the agency theory and the stewardship theory were used to underpin this study. The signaling theory predicts that a firm the quality of information reported to the public domain by the firm sent signals in the mind of the investors to undertake relevant actions that would either maximize or lower the market value of the firms (Ross, 1977). Reporting positive financial information for instance would send a positive signal to investors and this may lead to an increase in market price of the share. The agency theory argues that in the absence conflicting interests between the firm managers and the shareholders, quality financial information would always be shared with the public (Alchian & Demsetz, 1972 & Jensen & Meckling, 1976). The stewardship theory predicts that management of the firm has a strong incentive of undertaking actions that contribute towards maximization of the shareholder wealth (Donaldson & Davis,

1989). As such, corporate governance is seen to have an insignificant implication on financial reporting quality of the firm under this stewardship theory.

The listed non-financial firms in deal in operations that range from manufacturing, agriculture, building and constructions as well as commercial and energy products. Media reports have indicated a number of financial misreporting and account overstatement among these firms. A good example include CMC Motors and Uchumi where the directors were alleged to have manipulated the books of account amounting to Kshs. 1.04 billion (Iraya, Mwangi and Muchoki, 2015, & Herbling, 2016). The other non-financial listed firms in Kenya whose directors have been accused of account overstatement include Mumias Sugar Ltd. The justification of focusing on non-financial listed firms is because

#### **1.1.1** Corporate Governance

It describes the relationship existing between the shareholders, managers and the board of directors of the firm. It can also be defined as the mechanisms the firm has put in place to provide control to the operations (Almaqtari, Hashed, Shamim & Al-ahdal, 2021). According to Hsu and Yang (2022), CG is about making sure that the firm is well managed so that a fair share of return is available to investors. CG can further be defined as the system which direct and control the operations of the firm (Góis, 2009). Corporate governance provides the procedures and rules that can guide decision making with regard to corporate issues. Corporate governance is the mechanisms through which the objectives of the firm can be established and realized (Bako, 2018).

Therefore, the three key tenets of corporate governance include the shareholders, the managers and the board of directors. While shareholders are owners of the firm responsible for providing firms, the managers have the responsibility of running the daily affairs of the firm. On the other

hand, the board of directors has the responsibility of overseeing and checking the decisions and undertakings by those in management roles (Hopkinson, 2017). As a key aspect of CG, the board and its attributes like size, independence and audit committee are instrumental when it comes to management of the affairs of the firm. Board independence is a component of the directors who are not executives to the board. Audit quality is another aspect of corporate governance that plays an instrumental role as far as the operations of the firm are concerned. In the present study, corporate governance was measured by board independence and audit quality (Hasan, Aly & Hussainey, 2022).

#### 1.1.2 Financial Reporting Quality

This relates to the attributes of the information that is published in the financial statements of the firm including the note disclosures. It is the accuracy of the information in the financial statements (Herath & Albarqi, 2017). Financial reporting quality can be viewed in qualitative as well as quantitative perspectives. From the qualitative point of view, financial reporting quality can cover an array of attributes like timeliness, reliability, accuracy, relevance and completeness among other characteristics of the financial information (Zhang, 2019). Quantitative consideration of financial reporting quality focuses on accruals and it require collection of information from financial statements to determine the proxy (Gaynor, Kelton, Mercer & Yohn, 2016).

In qualitative terms, the financial statements of the firm should be relevant and provide faithful representation of the state of affairs of the firm. From the quantitative point of view, a number of models have been advanced as far as financial reporting quality is concerned which include the accrual model and the earnings relevance model among others (Klai & Omri, 2011). The accrual model can be adopted in determining how best the accruals of the firm are mapped into the cash

flows (Bhuiyan, Salma, Roudaki & Tavite, 2020). This model has the ability of defining the accrual quality as the error variation from regressing accruals of working capital on lagged, current as well as previous cash flows of the firm (Aifuwa& Embele, 2019). The value relevance model is designed in such a manner so as to carry out an assessment of whether a given amount in books of accounts is a reflection of the information that shareholders and analysts utilize when valuing the equity of the firm and determine the nexus between the price of security and a number of variables in accounting (Beaver, 2002). In the present study, accrual model (Dechow, Sloan & Sweeney, 1995) was used to measure the financial reporting quality represented by Net income minus the cash flow from operating activities within a specified year.

#### 1.1.3 Corporate Governance and Financial Reporting Quality

From the agency theoretical point of view, it is predicted that in absence of conflict of interests between the management and the shareholders, the managers will always have an incentive of presenting quality financial statement to the general public (Góis, 2009). However, thus only applies in an ideal world. In reality, managers always have interests that are not well aligned with those of the shareholders creating conflicts even in the presence of strong corporate governance mechanisms. The signaling theory predicts that managers may have an incentive to overstate the financial statements so as to send the positive signal to investors that the firm is doing well which would in turn lead to a temporal maximization of the value of the share (Barako, Hancock & Izan, 2006).

Empirically, Al-Khonain and Al-Adeem (2020) observed that CG contributes towards an improvement in financial reporting quality of the firm. Góis (2009) said that the composition of the board and the change in the degree of its independence critically contribute towards financial

reporting quality. Hasan, Aly and Hussainey (2022) were of the opinion that the size of the board and financial reporting quality are inversely linked with each other. Klai and Omri (2011) noted that CG has significant effect on FRQ of the firm. Onuorah and Friday (2016) obtained mixed results of positive and negative nexus between the proxies of CG and FRQ. Bako (2018) shared that the independence and size of the board both have an insignificant link with financial reporting quality of the firm.

#### 1.1.4 Non Financial Firms listed at the Nairobi Securities Exchange

The NSE is a platform where investors buy and sell shares to generate the required returns. Thus, the NSE is a platform that allows firms to access funds needed to fund investment projects. The operations of the stock brokers and the listed firms at the NSE are closely regulated by the Capital Market Authority (CMA). As a regulator, the CMA can list and delist some of the firms that are found to be involved in malpractices particularly revolving around corporate governance.

There are 36 listed non-monetary listed entities on the NSE that operate in a number of bourses. These firms are involved in services or products that are financial related. The challenge with these firms is that they have constantly encountered issues revolving around the quality of their financial reports. For instance, the directors of Uchumi Supermarket Ltd were accused of manipulation of the financial accounts running into billions. Other non-financial listed firms that have witnessed similar incidences include the CMC Motors and the Mumias Sugar Company Ltd. The justification of using non-financial listed firms is that they have received inadequate attention in literature despite facing challenges in regard to their financial reporting quality.

#### 1.2 Research Problem

Quality financial information is a prerequisite of rational decision making that would contribute towards maximization of the shareholder wealth. Poor financial reporting can mislead the decision making ability of the investors and the lenders (Bako, 2018). Key stakeholders in the firm including the investors, shareholders, lenders and the general public require quality financial information that is accurate and reliable so that informed decisions can be made. The agency theory predicts that in absence of conflicting concerns between those in management and the shareholders of the firm, managers will have less incentive of manipulating the financial statements thus quality financial reporting would be evident (Barako, Hancock & Izan, 2006).

The listed non-financial firms in Kenya have encountered numerous challenges revolving around financial reporting. These issues include the manipulation of financial accounts running into billions of money. Some examples of these firms include CMC Motors, Mumias Sugar Ltd as well Uchumi Supermarket Ltd among others. This has contributed towards significant loss in the value of the shareholders. Besides the shareholders, lenders including financial institutions have negatively been affected by the fact that they advanced loans to some of these non-financial firms on account of positive financial results that had been manipulated leading to significant loss in loan revenues.

The available studies from a global perspective include Klai and Omri (2011) who focused on firms in Tunisia to analyze how CG and financial reporting quality are interlinked where a significant effect was reported. Among some identified firms in Nigeria, Onuorah and Friday (2016) conducted an analysis of CG and quality of financial reporting where mixed results of positive and negative nexus was registered between the CG constructs and financial reporting

quality. Bako (2018) did a study with focus on CG and its impact on financial reporting among Paint and Chemical firms in Nigeria and an insignificant relationship was registered. The study conducted in Jordan by Albawwat, Al-Hajaia and Al-Frijat (2021) placed more emphasis on the personality traits of the internal auditor and their nexus with financial reporting quality where a significant relationship was registered.

Locally in Kenya, Barako, Hancock and Izan (2006) focused on the attributes of corporate governance and their nexus with voluntary disclosures in full year reports. It emerged that the presence of the audit committee is a key factor that is significantly linked with a greater level of voluntary disclosure. Oduor (2015) did an appraisal of CG mechanisms and their link with financial reporting in Kenyan context and a significant link was noted. Nyaruri, Mburu and Omurwa (2019) did an analysis of CG quality and the link with financial performance of the firms in the manufacturing concern in Kenya that are listed at NSE where a positive and significant nexus was reported. Hopkinson (2017) did an analysis of CG practices and their link with financial reporting of listed firms at the NSE. It emerged from analysis that the composition of the board, internal and external audit are key predictors of financial reporting of the firm.

The aforementioned studies like Klai and Omri (2011) and Onuorah and Friday (2016) were done in different countries covering Tunisia and Nigeria respectively and not Kenya resulting into contextual gaps. Other studies like Nyaruri, Mburu and Omurwa (2019) although were conducted in Kenya, they focused on financial performance and not financial reporting quality as the dependent variable leading conceptual gaps.

#### 1.3 Research Objective

The study sought to establish the effect of corporate governance on financial reporting quality among non-financial listed firms at the Nairobi Securities Exchange, Kenya

#### 1.4 Value of the Study

The study would contribute to understanding of the nexus between CG and FRQ. This would help the shareholders to put in place strong boards so as to oversee the actions undertaken by the management. The managers working among the listed non-financial firms would be in position to understand their role as an important aspect of corporate governance at firm level. The study would help the policy makers at the CMA to formulate relevant policies and regulations as far as CG is concerned. The policy makers would be in position to formulate policies in regard to CG and FRQ. This would contribute to the overall stability of these firms. The study would increase the available literature and knowledge on CG and FRQ. The inquiry would act as a basis for conducting related inquiries in future. The study would agree or disagree with the available theories on CG and FRQ.

#### **CHAPTER TWO: LITERATURE REVIEW**

#### 2.1 Introduction

The theories informing the inquiry are reviewed in this chapter. The empirical evidence on CG-FRQ nexus are also reviewed. The chapter further revolves around the gaps from the reviewed literature as well as the conceptual framework.

#### 2.2 Theoretical Review

Literature on signaling theory, agency theory and the stewardship theory is covered here. Signaling theory was used to anchor the dependent variable FRQ. The agency and stewardship theory underpinned the independent variable CG.

#### 2.2.1 Signaling Theory

The proponent of this theory was Ross (1977) and it argues that due to information asymmetry, blue chip firms can leverage financial information to send signals to the market participants. The information that managers disclose in the public domain contributes towards reduction in information asymmetry and market participants will interpret it as good signal in the market. This theory has been widely in literature involving information disclosure at firm level (Haniffa & Cooke, 2002). This theory argues that the managers and directors who highly believe that their firm can achieve better performance as compared to others in the industry will always strive to send the same signal to shareholders so that more investment is attracted.

The theory further argues that when the performance of the firm is good, managers will strive to signal the same to investors and other stakeholders by making disclosure which poor firm is not able to make. Through the increase information disclosure, managers will stand to enjoy more

benefits in terms of value and reputation at firm level. On the contrary, firms facing a challenge of poor performance will always want to remain silent as opposed to revealing performance which is not favorable and desirable. However, this silence may be misinterpreted by investors as withholding the worst information as possible at the firm level (Verrecchia, 1983).

This theory has been criticized for assuming that people including investors and shareholders will also undertake relevant actions whenever managers undertake a given action. The theory is also premised on realistic assumption that insiders in the firm have more information concerning the firm more than the outsiders leading to information asymmetry. Despite these criticisms, this theory will be used to underpin and demonstrate how investors interpret the information presented in financial statements of the firm and how the same is affected by corporate governance. The theory seeks to provide the answer to the following question: how do investors interpret the overstated or manipulated statements of the financial of the firm and how does corporate governance come in to remit the same?

#### 2.2.2 Agency Theory

Alchian and Demsetz (1972) as well Jensen and Meckling (1976) are the brain behind this theory and it is used to identify the nexus between the agent and the principal. It is the separation of ownership and management that gives rise to agency relationship established by this theoretical stance. In order to revolve the conflicts between the agents and the principals, some costs are incurred. Some of the agency costs include compensation and bonuses tied to the performance outcomes, engagement of the external auditors among other expenses.

There are a number of criticisms that are related with this agency theory like the self-interested or opportunistic behavior of those charged with managerial positions. Furthermore, the agent may

only partially act in the best interest of the principal. There always exists information asymmetry that stems from the agency relationship because managers have the ability to access information concerning the firm more as compared to shareholders (Jensen & Meckling, 1976). Through this, the self-interested shareholders will not have an incentive to act in the best interest of the shareholders thus increasing the agency costs of the firm which would in turn be reflected in earnings of the firm. The relevance of this theory to the study is that it underpins salient features of corporate governance include the independence and the audit committee quality as monitoring tools to the behavior of the managers.

#### 2.2.3 Stewardship Theory

The proponents of this stewardship theory were Donaldson and Davis (1989) and its argument is that when left on their own, the management of the firm will carry out their duties as responsible stewards in regard to the assets they have been trusted to control. As such, there exists a strong link between success at an organizational level and satisfaction of the managers of the firm (Chrisman, 2019). The theory predicts that managers and the directors of the firm have goals that are well aligned with each other. The manager has a strong incentive and motivation of acting in the best interests of the firm and to place more emphasis on intangible rewards like achievement and chances for individual growth (Davis, Schoorman & Donaldson, 2018).

In this theory, the owner and the managers have one agenda in common and the board has a role of development of strategy as opposed to provision of the oversight role (Contrafatto, 2014). Being stewards, the theory argues that managers will have a high motivation and satisfaction when an organization is successful. The theory reinforces the role of the staff or executives to be more autonomous with the aim of maximizing the returns of the shareholders (Keay, 2017). The staffs

are responsible for taking ownership of their jobs and always seek to execute them with diligence. Despite the significant contribution of this theory in corporate finance literature, it has been critiqued for assuming that managers are not self-interested and that they undertake actions in the best interest of the shareholders. This is not the case because managers may be self-centered to achieve their personal growth by allocating themselves with heavy perks and under-investment (Kluvers & Tippett, 2011). Despite this criticism, this theory will be used to predict the effect of CG on FRQ in an environment where managers are stewards.

#### 2.3 Determinants of Financial Reporting Quality among Non-Financial Listed Firms

The subsequent sections are set out to outline the determinants of FRQ among non-financial listed firms.

#### 2.3.1 Board Independence

Board independence is reflected in the proportion of independent directors against the total directors of the firm. Klein (2002) shared that board independence is critical in mitigating incidence of earnings management at firm level. Karamanou and Vafeas (2005) argued that the information quality shared by the firm to the public increases with a rise in the number of outside directors. Board independence allow firm to disclose information of high quality in their financial statements. Klein (2002) and Peasnell et al (2000) shared that board having a high proportion of independent directors will be in position to mitigate against earnings management. Firth, Fung and Rui (2007) noted that having a significant proportion of independent directors on the board contribute towards an improvement in the quality of earnings. On the contrary, Ahmed et al (2006), Bradbury et al (2006) and Petra (2007) failed to obtain sufficient evidence and asserted that board

independence has no significant link with FRQ. Cornett, Mc Nutt and Tehranian (2009) on the other hand obtained a negative nexus between board independence and financial reporting quality.

#### 2.3.2 Audit Quality

The audit committee is an instrumental component of corporate governance that helps in checking and monitoring the actions of those in management. The responsibilities and roles of the internal auditors are critical in corporate governance aspects of the firms as they play a role in earnings management (Rezaee, 2008 & Rezaee & Riley, 2010). Parwit, Smith and Wood (2009) and Greco (2012) noted that firms having good internal audit quality function will strongly discourage the manipulation of earnings and thus such firm will be associated with a decreased accrual values. The engagement of external auditors among the Big-4 audit firms is a move that shareholders have in place of ensuring the financial statements are true reflection of the state of affairs of the firm. This is aimed at boosting the confidence of the shareholders in the financial statements published by the firm. Leung, Morris and Gray (2005) noted that presence of the external auditors in the big-4 is a signal of quality financial information that directors will have disclosed.

#### 2.3.3 Liquidity

Theoretically, it is expected that an increase in information quality coupled with voluntary disclose is associated with a reduction on information asymmetry. It is this reduced information asymmetry that results into an increase in liquidity position of the firm (Hassan & Bello, 2013; Easley & O'Hara, 2004). Empirically, disclosure of accounting information that is of high quality leads to an improvement the liquidity position of the firm.

#### 2.3.4 Firm Leverage

The agency theory predicts that the nexus between liquidity and FRQ. Levered firms have an incentive to disclose more information (Jensen & Meckling, 1976). However, empirical evidence on this nexus seems to be mixed and inconclusive. For instance, Naser et al (2002), Hassan et al. (2006) and Adelopo (2010) all documented existence of a positive nexus, Zarzeski (1996) and Ahmed (2012) established existence of an inverse link. Debts against debts plus equity will be used as a proxy of financial leverage.

#### 2.4 Empirical Review

Al-Khonain and Al-Adeem (2020) did an appraisal of corporate governance and the nexus with financial reporting quality focusing on Saudi Arabia. This was a survey in design and the analysts from LinkedIn profiles were surveyed. The results provided evidence that CG and FRQ are significantly connected with each other. Góis (2009) did a study in Portugal with emphasis on FRQ and CG. It emerged that the changes in the composition of the board and the degree of independence are not significantly linked with quality accounting related information.

Hasan, Aly and Hussainey (2022) did a study in Pakistan and United Kingdom and the focus was on CG and financial reporting quality covering the time horizon 2009-2018. It emerged that the independence of the board is positively linked with FRQ of the firm. It also emerged that the independence of the audit committee is negatively connected with FRQ. Baker and Persson (2021) conducted an inquiry with focus on FRQ and its role as far as CG is concerned. The study adopted desk research methodology with the review of relevant literature. It was observed from the reviewed literature that effective mechanisms of CG require an organization to put in place an

effective financial system of reporting. It was also noted that effectiveness of the financial reporting system needs an efficient mechanism of accounting.

Hsu and Yang (2022) did a study whose focus was on CG and FRQ in light of the COVID-19 pandemic. Leveraging evidence from listed firms in UK context, it emerged that during the pandemic, there was low quality of financial reporting. Klai and Omri (2011) did an analysis of CG and FRQ with emphasis on firms in Tunisia. It emerged from analysis that the mechanisms of CG are significantly linked with financial information quality. Onuorah and Friday (2016) used the case of Nigeria to analyze the nexus between CG and FRQ. It was pointed out that independence of the directors and quality issues in auditing and FRQ are inversely linked with each other. Bako (2018) did an analysis of CG and its nexus with the quality of financial reporting focusing on Nigeria's context. The focus of the study was on listed entities within the time frame 2009-2013. It was shown that the independence and size of the board are insignificantly linked with financial reporting quality of the entity.

The study conducted by Nasir, Ali and Ahmed (2019) placed emphasis on CG, ethnicity of the board and fraud within financial statements within the context of Malaysia. Information was gathered from auxiliary sources within the time horizon of 2001 all through 2008. It was shown that fraud enterprises increase the component of independent directors within the board. Correa-Garcia, Garcia-Benau and Garcia-Meca (2020) did an analysis of CG and the quality in sustainability reporting in businesses within Latin America. The adopted analytical model was logistic regression. It was shown that variables like the size of the board and the age of business groups play an instrumental role in allowing and helping organizations to enhance the quality of their financial reports.

The study by Ortega (2021) conducted an assessment of CG and the implication with FR as well as profitability of banks. A total of 80 banks were covered over the period 2015-2018. The study noted that robustness of the financial reporting system of an organization is an instrumental component of financial performance of an entity. Al-Karabsheh (2021) did an analysis of CG and the implication with credibility as well as the quality of accounting information within financial statement among Jordanian commercial banks. While adopting desk research methodology, it was observed that strengthening corporate governance mechanisms allow the firm to improve the credibility of the published financial statements.

In Kenya, Barako, Hancock and Izan (2006) did a study on CG attributes and the link with voluntary disclosure in the annually published reports. It emerged from analysis showed that the audit committee is a key factor that is linked with voluntary disclosure. Oduor (2015) did an examination of CG mechanisms and their nexus with quality of financial reporting in Kano Plains Ahero. The variables covered in this inquiry include the size, audit independence and board monitoring as far as the financial reporting quality is concerned. Correlational survey design was embraced in this inquiry where 85 participants were sampled. It was shown from the analysis that 67.2% variation in financial reporting quality is explained by the CG mechanisms including the independent of the audit committee and the ownership structure.

In a study by Nyaruri, Mburu and Omurwa (2019), the independence, size and duality of the chief executive role as well as board meetings were the variables of interest. Leveraging a longitudinal research design, it emerged that CG quality is significantly connected with financial performance. Leveraging information from primary sources, Hopkinson (2017) pointed out that CG practices explain financial reporting quality. Nyatichi, Iraya, Mwangi and Njihia (2020) did a study on CG and earnings management of listed entities at the NSE. The embraced design was correlational

descriptive research design besides the adoption of panel data methodology. The sample covered 56 listed entities within the time horizon 2008-2017. Hypotheses were developed and tested in this inquiry. It emerged that the size of the board has statistically significant implication on earnings management of the entity. It was then inferred that CG is a significant predictor of earnings management.

#### 2.5 Summary of Literature and Gaps

The chapter has reviewed empirical studies that create gaps which will inform the present study. The reviewed literature revolves around the signaling theory, the agency theory and the stewardship theory. The main theory of the study which anchors the dependent variable the financial reporting quality is the signaling theory. The review of literature also focused on the determinants of FRQ. In this section, a review of literature identified these determinants to include board independence, audit quality, liquidity and firm leverage. While board independence and audit quality are the proxies of corporate governance which is the independent variable of the study, liquidity and leverage are the control variables that will be adopted in this study.

From the aforementioned empirical studies that were reviewed, a number of gaps are presented. For instance, some of the studies were conducted in other countries like Saudi Arabia, Portugal, Pakistan and United Kingdom as well as United Kingdom. This presents contextual gaps. Other studies were conducted using financial reporting quality as the independent variable which is conceptually different from the current study that adopts this as a dependent variable. Other studies link CG and earning management which conceptually different from financial reporting quality.

#### 2.6 Conceptual Framework

The independent variable of the study is CG and it was examined along two indicators being board independence and audit quality. The study also considered two control variables being liquidity and firm leverage. The dependent variable is financial reporting quality and it was represented by net income net the cash flow from operations of the firm.

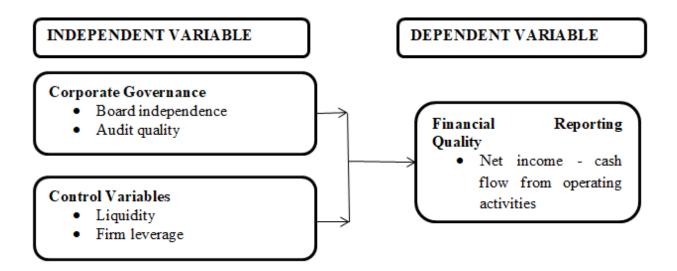


Figure 2.1: Conceptual Framework

#### **CHAPTER THREE: RESEARCH METHODOLOGY**

#### 3.1 introduction

The design of the inquiry, targeted participants and means of obtaining the evidence for the inquiry are detailed in this chapter. It also focuses on the methods for analysis of the findings and the associated diagnostic tests.

#### 3.2 Research Design

Correlational research design was embraced in this inquiry. Correlational design was instrumental in determining the cause effect nexus between CG and financial reporting quality. In this way, it was possible for the study to adopt quantitative techniques for data gathering and analysis supported by correlation and regression analysis.

#### 3.3 Population of the Study

In total, 36 non-monetary listed entities on NSE (appendix II) were targeted in this inquiry. This was reinforced by census. It then follows that all these entities were included in the inquiry.

#### 3.4 Data Collection

The study collected secondary from the NSE print outs and the financial statements of the respective firms. The horizon of consideration was from 2017-2021. The data was gathered on annual basis. Appendix I was used in gathering information. The study collected annual data that is easily available in published reports.

#### 3.5 Data Analysis

The analysis of the gathered evidence was executed through SPSS and presented through tables.

#### 3.5.1 Model Specification

β1-4 Beta Coefficients

FRQ<sub>it</sub> =  $\beta_0 + \beta_1 B I_{it} + \beta_2 A Q_{it} + \beta_3 L_t + \beta_4 F R_{it} + \epsilon_{it}$ FRQ<sub>it</sub> is FRQ of firm i at time t

BI<sub>it</sub> is board independence of firm i at time t

AQ<sub>it</sub> is audit quality of firm i at time t

L<sub>it</sub> is liquidity of firm i at time t

FR<sub>it</sub> is firm leverage of firm i at time t  $\beta_0 I_t$  is Constant of firm i at time t

#### 3.5.2 Operationalization of Variables

Table 3.1 is a summary of variables and their operationalization:

**Table 3.1: Operationalization of Variables** 

Type of Variable	Measurement	Scale of measurement
Independent board independence	<ul> <li>Independent directors/total directors</li> </ul>	Ratio
Independent audit quality	<ul> <li>No. of audit committee members/total directors</li> </ul>	Ratio
Control liquidity	• Current assets/current liabilities	Ratio
Control firm leverage	<ul> <li>Debts/(Debts + Equity)</li> </ul>	Ratio
Dependent variable financial reporting quality	<ul> <li>Net income - cash flow from operating activities</li> </ul>	Continuous

#### 3.5.3 Diagnostic Tests

These included normality, autocorrelation and multicolinearity test. A discussion of these tests is provided below:

**Normality Test**: Normality is a situation when the data observes the attributes of a normal distribution. Regression analysis should be based on the data that obey this assumption. Shapiro-

wilk test was to test the presence of normality. The p-value above 0.05 from this test provided an indication of presence of this assumption (Osborne & Waters, 2002).

**Autocorrelation Test:** Durbin Watson test statistic was computed to determine presence of this assumption. The resultant values from this test closer or equal to 2 provide an indication of absence of this assumption (Garson, 2012).

**Multicolinearity Test:** VIFs were computed to predict the presence of this assumption. The values of VIF within range 1-10 provide an indication of absence of multicolinearity in a sample data (Sarstedt & Mooi, 2019).

# CHAPTER FOUR: DATA ANALYSIS, INTERPRETATION AND DISCUSSION

#### 4.1 Introduction

The focus of this study is on providing the findings of analysis as informed by the information that was gathered from participants.

#### **4.2 Descriptive Statistics**

Table 4.1 is a breakdown of results

**Table 4.1: Descriptive Statistics** 

	N	Min	Max	Mean	Std. Dev
Board Independence	180	.00	.99	.266	.253
Audit quality	180	.01	.95	.379	.252
Liquidity	180	.16	12.06	3.170	2.697
Firm Leverage	180	.02	6.01	.254	.543
Financial reporting quality	180	.03	.76	.202	.150

Source: Research Data (2022)

The average value of board independence was 0.266; this implies that about 26.6% of the board members in the non-financial listed firms in Kenya are independent directors. This means that board independence is recognized among these firms. The findings on audit quality indicate the value of average as 0.379; this implies that there was a significant proportion in the audit committees in the studied firms. The results on firm leverage were that the average value was 0.254, this means that debts comprised of 25.4% of the CS In the studied entities. This implies that the non-financial listed firms in Kenya have a strong incentive to use equities as opposed to debts in funding investment projects. On financial reporting quality, the average value was 0.202; this means that there were strong financial reporting mechanisms in the studied non-financial listed firms at the NSE.

#### **4.3 Diagnostic Tests**

A discussion of these tests is provided below:

#### **4.3.1 Normality Test**

Normality is a situation when the data observes the attributes of a normal distribution. Regression analysis should be based on the data that obey this assumption. Shapiro-wilk test was to test the presence of normality.

**Table 4.2: Normality Test** 

-	Shapiro-Wilk		
	Statistic	Sig.	
Board Independence	.857	.260	
Audit quality	.912	.425	
Liquidity	.933	.502	
Firm Leverage	.775	.056	
Financial reporting quality	.887	.346	

Source: Research Data (2022)

The p-values for the respective variables are all greater than 0.05. This is consistent with Osborne and Waters (2002) who noted that when testing normality using Shapiro-Wilk test, p-value above 0.05 provide an indication of presence of this assumption.

#### **4.3.2** Autocorrelation Test

Durbin Watson test statistic was computed to determine presence of this assumption). Table 4.3 is a breakdown of the findings on autocorrelation results.

**Table 4.3: Autocorrelation Test** 

Model	Durbin-Watson	
1	1.835	

Source: Research Data (2022)

The value of Durbin Watson Statistic is given as 1.835, which is close to the value 2. As observed by Garson (2012), when testing for autocorrelation using Durbin Watson, values closer or equal

to 2 signify absence of this condition. Thus, it can be infered that there was no autocorrelation condition in the sample data that was u8sed in the study.

#### **4.3.3** Multicolinearity Test

Multicolinearity is conducted to ascertain if any of the independent variables are closely related with each other. This should not be the case as it violation of the regression analysis assumption.

**Table 4.4: Multicolinearity Test** 

	Collinearity Statistics		
	Tolerance	VIF	
Board Independence	.991	1.010	
Audit quality	.943	1.061	
Liquidity	.909	1.100	
Firm Leverage	.963	1.039	
Average	.952	1.053	

Source: Research Data (2022)

From Table 4.4, the average value of VIF is given as 1.039 which happens to be within the range of 1-10. Sarstedt and Mooi (2019) noted that when testing for multicolinearity assumption using VIF, the within range of 1-10 signify absence of this assumption and thus the suitability of the sample data to regression analysis.

#### **4.4 Correlation Matrix**

Consider Table 4.5.

**Table 4.5: Correlation Matrix** 

		Financial reporting quality	Board Independen ce	Audit quality	Liquidi ty	Firm Leverage
Financial	Pearson Correlation					
reporting		1				
quality						
Board	Pearson Correlation	.110	1			
Independence		.110	1			
Audit quality	Pearson Correlation	.813	.004	1		
Liquidity	Pearson Correlation	.501	.094	.221	1	
Firm Leverage	Pearson Correlation	.037	.019	.048	.172	1

Source: Research Data (2022)

The findings in Table 4.5 indicate that audit quality (r=0.813) and liquidity (r=0.501) were strong and positive correlates of financial reporting quality. Board independence (r=0.110) and firm leverage (r=0.037) had moderate and positive correlates of financial reporting quality among non-financial listed firms at the Nairobi Securities Exchange, Kenya. It then follows that corporate governance is a positive correlate of FRQ.

#### 4.5 Regression Results and Hypotheses Testing

Table 4.6 is a breakdown of the regression model summary.

**Table 4.6: Model Summary** 

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.881ª	.776	.771	.07226

Source: Research Data (2022)

It emerged that 77.1% variation in financial reporting quality among non-financial listed firms at the Nairobi Securities Exchange Kenya is explained by change in corporate governance. This means that aside corporate governance; there are other additional factors that have an effect on FRQ among non-financial listed firms at the Nairobi Securities Exchange, Kenya.

Table 4.7: ANOVA

	Sum of Squares	$\mathbf{df}$	Mean Square	F	Sig.
Regression	3.166	4	.791	151.564	.000b
Residual	.914	175	.005		
Total	4.080	179			

Source: Research Data (2022)

Being significant (F= 151.564, p<0.05), it can be inferred that the model was suitable for use in predicting corporate governance on FRQ.. The findings in Table 4.8 indicate the beta coefficients and significance.

**Table 4.8: Beta Coefficients and Significance** 

	Unstandardized Coefficients		Standardized Coefficients		
	В	Std. Error	β	t	Sig.
(Constant)	.037	.012		3.072	.002
Board Independence	.049	.021	.082	2.268	.025
Audit quality	.443	.022	.742	20.128	.000
Liquidity	.018	.002	.327	8.706	.000
Firm Leverage	.058	.012	.337	4.833	.000

Source: Research Data (2022)

From Table 4.8, the following equation is predicted between corporate governance and financial reporting quality:

#### $FRQ = .037 + .049X_1 + .443X_1 + .018X_1 + .058X_1$

The findings in Table 4.8 indicate audit quality ( $\beta$ =.443, p<0.05 & t>1.96) had the greatest significant effect on FRQ followed by firm leverage ( $\beta$ =.058, p<0.05 & t>1.96), board independence ( $\beta$ =.049, p<0.05 & t>1.96) and liquidity ( $\beta$ =.018, p<0.05 & t>1.96). Thus, corporate governance is a significant predictor of FRQ.

#### 4.6 Discussion of Research Findings

Audit quality (r=0.813) and liquidity (r=0.501) were strong and positive correlates of FRQ. The finding is consistent with Parwit et al. (2009) and Greco (2012) who noted that firms having good internal audit quality function will strongly discourage the manipulation of earnings and thus such firm will be associated with a decreased accrual values. Board independence (r=0.110) and firm leverage (r=0.037) had moderate and positive correlates of financial reporting quality. The finding contradicts with Cornett, Mc Nutt and Tehranian (2009) who obtained a negative nexus between board independence and FRQ.

The study inferred that CG is a positive correlate of FRQ. Audit quality ( $\beta$ =.443, p<0.05 & t>1.96) had significant effect on FRQ. Hasan, Aly and Hussainey (2022) shared that emerged that the independence of the board is positively linked with FRQ of the firm where it emerged that the independence of the audit committee is negatively connected with FRQ. Firm leverage ( $\beta$ =.058, p<0.05 & t>1.96) was a significant predictor of FRQ.

Board independence (β=.049, p<0.05 & t>1.96) had significant effect on FRQ. The finding is supported by Fung and Rui (2007) who noted that having a significant proportion of independent directors on the board contribute towards an improvement in the quality of earnings. However, the finding contradict Ahmed et al (2006), Bradbury et al (2006) and Petra (2007) who failed to obtain sufficient evidence and asserted that board independence has no significant link with FRQ Liquidity ( $\beta$ =.018, p<0.05 & t>1.96) significantly contributed towards FRQ. Corporate governance is a significant predictor of financial reporting quality. Al-Khonain and Al-Adeem (2020) provided evidence that CG and FRQ are significantly connected with each other. Góis (2009) noted that the changes in the composition of the board and the degree of independence are not significantly linked with quality accounting related information. Baker and Persson (2021) observed from the reviewed literature that effective mechanisms of CG require an organization to put in place an effective financial system of reporting. Klai and Omri (2011) revealed that the mechanisms of CG are significantly linked with financial information quality. Bako (2018) showed that the independence and size of the board are insignificantly linked with financial reporting quality of the entity.

CHAPTER FIVE: SUMMARY, CONCLUSION AND

RECOMMENDATIONS

5.1 Introduction

The chapter details a summary of the findings and the conclusion that was drawn. The

recommendations, limitations and suggestions that require further research are also pointed out.

**5.2 Summary** 

This study was set out to document the link between CG and FRQ. The findings of descriptive

statistics were that board independence is recognized among these firms and that there was a

significant proportion in the audit committees in the studied firms. The entities under

consideration had a strong incentive to use equities as opposed to debts in funding investment

projects. There were strong financial reporting mechanisms in the studied non-financial listed

firms at the NSE.

Correlation analysis results were that while audit quality and were strong and positive correlates

of FRQ, board independence and firm leverage had moderate and positive correlates. Thus,

corporate governance is a positive correlate of financial reporting quality among non-financial

listed firms at the Nairobi Securities Exchange, Kenya.

From regression analysis, the study established that over seventy percent variation in financial

reporting quality is explained by change in corporate governance. Audit quality had the greatest

significant effect on financial reporting quality among non-financial listed firms at the Nairobi

Securities Exchange, Kenya followed by firm leverage, board independence and liquidity. Thus,

corporate governance is a significant predictor of financial reporting quality.

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#### **5.3 Conclusion**

Corporate governance is a positive correlate of FRQ. This means that an improvement in financial reporting mechanisms and quality at firm level require an overhaul of the corporate governance practices. This conclusion is established in the agency theory that require a firm to have in place strong corporate governance mechanisms so as to counter possible conflict of interests between shareholders and the managers as well as the management and the board of directors. By strengthening the corporate governance arrangements, it would be hard for those in management to misreport information in the financial statements.

CG is a significant predictor of FRQ. This means that enhancing corporate governance in an organization can lead to an improvement in financial reporting quality. In order words, a firm that has strong corporate governance mechanisms will have managers with strong incentive to communicate quality information in their financial statements. This conclusion is in sharp contrast with the stewardship theory that considers corporate governance as an irrelevant practice as far as financial reporting quality. As such, this theory predicts that irrespective of the strength of the CG mechanisms, managers in the firm will always have strong incentive to act in the best interests of the firm and its shareholders. On the other hand, weak CG mechanisms provide opportunity for the managers to collude with the directors to adjust the financial statements or over-state figures and even engage in earnings management and accounts manipulation. This may in turn compromise the quality of financial reports that will be availed in public domain which are needed for use in decision making by investors and analysts among other interested parties.

The specific aspects of corporate governance that inform better financial reporting include board independence and audit quality. Having a greater proportion of independent directors is a strong indicator of corporate governance that leads to better financial reporting quality. Unlike executive

directors who are mostly insiders, independent directors are usually outsiders to a body corporate and it is hard for managers to collude with them. Additionally, independent directors are believed to bring in diverse experience and expertise like in the field of fraud detection which may deter misreporting of information in financial statements of the firm by those in management.

Audit quality in terms of independent audit committee members in the firm, the size of the committee and whether is an external auditors also enhances financial reporting quality of the firm. Having in place independent directors on the audit committee may increase the overall independence of the board contributing to an increase in efficiency in execution of the duties. An optimal audit committee size is critical in coordinating the board the activities contributing to an enhanced oversight role. Liquidity and firm leverage should be controlled for even as firms seek to enhance their corporate governance mechanisms so as to improve on their financial reporting quality.

#### **5.4 Recommendations of the Study**

The board of directors in the non-financial listed firms at the Nairobi Securities Exchange; Kenya should play a more effective oversight role to enhance the corporate governance mechanisms. The shareholders should demand a more accountable and active role on the side of the management.

Liquidity and leverage were found to be key control variables in this study. Based on this finding, it is recommended that the finance managers working in the listed non-financial firms in Kenya should seek to balance between current assets and current liabilities in order to achieve optimal liquidity position that has been seen to play an instrumental role in FRQ. The finance managers of these non-financial listed firms in Kenya should also strive for a balance between debts and equities to attain optimal leverage position that can help in FRQ.

The finance managers of the non-financial listed firms at the NSE should ensure quality financial statements are prepared and communicated to the public domain. The policy makers should formulate and implement sound policies in regard to corporate governance and financial reporting. Policy makers at CMA need to develop sound policies on corporate governance mechanisms for the listed firms.

## 5.5 Limitations of the Study

The present study was limited on the non-financial listed firms at the Nairobi Securities Exchange; Kenya. In total, 36 firms were covered through census. These firms were selected because of the media reports that had implicated them for widespread involvement in misreporting and overstatement of their financial statements. This in way raised the need for an analysis of their FRQ and further asses their CG mechanisms.

The inquiry leveraged CG as the independent and FRQ as the dependent variables. Leverage and liquidity were also covered as the control variables. It was 77.1% variation in financial reporting quality among non-financial listed firms at the Nairobi Securities Exchange; Kenya is explained by change in corporate governance. The limitation from this is that similar studies conducted by adding other additional variables like the intervening may yield inconsistent results.

The methodology adopted in gathering of information in the present study was the auxiliary sources. In this regard, information was gathered on a longitudinal basis covering the time period 2017-2021. The sources of this information included the reports and publications by NSE, CMA and the end year financial statements from the respective firms. The limitation arising from this is that information from auxiliary source is usually second hand and they may be possible chances of manipulation.

## **5.6 Suggestions for Further Research**

In the present study, 77.1% in FRQ was found to be explained by CG. It therefore means that there are additional factors with an effect on FRQ. Thus, the focus of future studies should be on identification of other factors aside from corporate governance that have an effect on financial reporting quality. These additional factors can include profitability among others.

Future studies should be conducted on either non listed firms or the financial listed firms. Examples of financial listed firms that can be covered in future studies include commercial banks and the insurance firms. The non-listed firms can include those operating in the manufacturing or processing sector. This will create room for the comparison of the findings.

The advantage linked with the use of information from primary as opposed to secondary sources is that such information is usually first hand. With this, it becomes a challenge for one to manipulate such information. Hence, the focus of future studies should be on combining information from both first hand and auxiliary sources.

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# **APPENDICES**

## **Appendix I: Data Collection Sheet**

Yea r	No. of independ ent directors	No. of audit committ ee member s	Total numbe r of board directo rs	Curre nt assets	Curren t liabiliti es	Debt s	Equiti es	Net incom e	Cash flow from operatio ns
2017		3	15						
2018									
2019									
2020									
2021									

## **Appendix II: Listed Non-Financial Firms**

#### AGRICULTURAL

- Eaagads Ltd
- Kapchorua Tea Co. Ltd
- Kakuzi
- 4. Limuru Tea Co. Ltd
- 5. Rea Vipingo Plantations Ltd
- 6. Sasini Ltd
- 7. Williamson Tea Kenya Ltd

#### COMMERCIAL AND SERVICES

- Express Ltd
- 2. Sameer Africa PLC
- 3. Kenya Airways Ltd
- 4. Nation Media Group
- 5. Standard Group Ltd
- 6. TPS Eastern Africa (Serena) Ltd
- Scangroup Ltd
- 8. Uchumi Supermarket Ltd
- 9. Longhorn Publishers Ltd
- 10. Deacons (East Africa) Plc
- 11. Nairobi Business Ventures Ltd

#### AUTOMOBILES AND ACCESSORIES

1. Car and General (K) Ltd

#### CONSTRUCTION AND ALLIED

- 1. Athi River Mining
- Bamburi Cement Ltd
- 3. Crown Paints Kenya PLC.
- 4. E.A.Cables Ltd
- 5. E.A.Portland Cement Ltd

#### ENERGY AND PETROLEUM

- 1. Total Kenya Ltd Ord
- KenGen Ltd Ord.
- 3. Kenya Power & Lighting Co Ltd
- 4. Umeme Ltd Ord

### MANUFACTURING AND ALLIED

- 1. B.O.C Kenya Ltd
- 2. British American Tobacco Kenya Ltd
- 3. Carbacid Investments Ltd
- 4. East African Breweries Ltd
- 5. Mumias Sugar Co. Ltd
- 6. Unga Group Ltd
- 7. Eveready East Africa Ltd
- 8. Kenya Orchards Ltd

Source: NSE (2022)

# **Appendix III: Raw Data**

Firm	Year	<b>Board Independence</b>	Audit quality	Liquidity	Firm Leverage	FRQ
$F_1$	2017	0.514	0.245	7.136	0.327	0.083
F <sub>2</sub>	2017	0.074	0.216	9.436	0.151	0.071
F <sub>3</sub>	2017	0.288	0.305	3.151	0.142	0.067
F <sub>4</sub>	2017	0.097	0.235	2.792	0.407	0.139
F <sub>5</sub>	2017	0.189	0.277	9.768	0.153	0.071
F <sub>6</sub>	2017	0.170	0.319	4.290	0.155	0.126
F <sub>7</sub>	2017	0.029	0.272	3.628	0.054	0.073
F <sub>8</sub>	2017	0.081	0.280	2.145	0.353	0.076
F <sub>9</sub>	2017	0.323	0.152	0.836	0.053	0.061
F <sub>10</sub>	2017	0.022	0.294	1.540	0.015	0.045
F <sub>11</sub>	2017	0.257	0.272	6.071	0.084	0.076
F <sub>12</sub>	2017	0.082	0.249	0.775	0.004	0.021
F <sub>13</sub>	2017	0.120	0.734	1.783	0.017	0.057
F <sub>14</sub>	2017	0.204	0.886	0.999	0.055	0.202
F <sub>15</sub>	2017	0.198	0.785	0.273	0.076	0.586
F <sub>16</sub>	2017	0.125	0.793	1.023	0.071	0.097
F <sub>17</sub>	2017	0.297	0.770	1.140	0.023	0.103
F <sub>18</sub>	2017	0.127	0.780	4.556	0.001	0.001
F <sub>19</sub>	2017	0.159	0.773	0.390	0.006	0.104
$F_{20}$	2017	0.001	0.784	2.891	0.811	0.406
F <sub>21</sub>	2017	0.103	0.699	0.933	0.225	0.400
F <sub>22</sub>	2017	0.315	0.790	4.974	0.076	0.216
F <sub>23</sub>	2017	0.097	0.815	5.318	0.044	0.444
F <sub>24</sub>	2017	0.216	0.818	4.158	0.102	0.211
F <sub>25</sub>	2017	0.211	0.853	8.813	0.027	0.123
F <sub>26</sub>	2017	0.104	0.938	0.410	0.037	0.109
F <sub>27</sub>	2017	0.086	0.588	3.171	0.003	0.046
F <sub>28</sub>	2017	0.400	0.949	8.851	0.074	0.105
F <sub>29</sub>	2017	0.046	0.749	1.896	0.112	0.216
F <sub>30</sub>	2017	0.216	0.425	3.668	0.040	0.086
F <sub>31</sub>	2017	0.109	0.611	1.187	0.267	0.386
F <sub>32</sub>	2017	0.105	0.364	1.282	0.181	0.212
F <sub>33</sub>	2017	0.212	0.782	0.282	0.044	0.251
F <sub>34</sub>	2017	0.251	0.392	2.818	0.000	0.047
F <sub>35</sub>	2017	0.123	0.453	6.050	0.244	0.315
F <sub>36</sub>	2017	0.444	0.233	2.229	0.003	0.306
$F_1$	2018	0.217	0.729	1.404	0.157	0.156

$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		,					
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		2018	0.342	0.499	1.624	0.052	0.342
F5         2018         0.362         0.535         1.243         0.300         0.112           F6         2018         0.109         0.567         1.462         0.148         0.074           F7         2018         0.290         0.350         3.228         1.123         0.146           F8         2018         0.209         0.436         1.703         0.480         0.074           F9         2018         0.090         0.623         1.272         0.519         0.163           F10         2018         0.071         0.541         9.467         0.082         0.078           F11         2018         0.071         0.541         9.467         0.082         0.078           F11         2018         0.462         0.112         1.629         0.129         0.107           F12         2018         0.462         0.112         1.629         0.129         0.107           F12         2018         0.462         0.112         1.629         0.129         0.107           F13         2018         0.287         0.555         2.310         0.005         0.030           F14         2018         0.128         0.287		2018	0.031	0.520	4.329	0.023	0.217
F6         2018         0.109         0.567         1.462         0.148         0.074           F7         2018         0.290         0.350         3.228         1.123         0.146           F8         2018         0.209         0.436         1.703         0.480         0.074           F9         2018         0.090         0.623         1.272         0.519         0.163           F10         2018         0.071         0.541         9.467         0.082         0.078           F11         2018         0.462         0.112         1.629         0.129         0.107           F12         2018         0.462         0.112         1.629         0.129         0.107           F12         2018         0.128         0.354         3.268         0.035         0.090           F13         2018         0.128         0.354         3.268         0.035         0.090           F13         2018         0.0287         0.555         2.310         0.005         0.030           F14         2018         0.030         0.228         0.234         0.022         0.070           F15         2018         0.080         0.296	F <sub>4</sub>	2018	0.189	0.275	2.556	0.489	0.069
F7         2018         0.290         0.350         3.228         1.123         0.146           F8         2018         0.209         0.436         1.703         0.480         0.074           F9         2018         0.090         0.623         1.272         0.519         0.163           F10         2018         0.071         0.541         9.467         0.082         0.078           F11         2018         0.462         0.112         1.629         0.129         0.107           F12         2018         0.128         0.354         3.268         0.035         0.090           F12         2018         0.128         0.354         3.268         0.035         0.090           F13         2018         0.287         0.555         2.310         0.005         0.030           F14         2018         0.177         0.277         11.390         0.203         0.072           F15         2018         0.080         0.228         0.234         0.022         0.070           F16         2018         0.696         0.596         0.999         0.048         0.074           F17         2018         0.430         0.412	$F_5$	2018	0.362	0.535	1.243	0.300	0.112
F8         2018         0.209         0.436         1.703         0.480         0.074           F9         2018         0.090         0.623         1.272         0.519         0.163           F10         2018         0.071         0.541         9.467         0.082         0.078           F11         2018         0.462         0.112         1.629         0.129         0.107           F12         2018         0.128         0.354         3.268         0.035         0.090           F13         2018         0.287         0.555         2.310         0.005         0.030           F14         2018         0.177         0.277         11.390         0.203         0.072           F15         2018         0.080         0.228         0.234         0.022         0.070           F16         2018         0.696         0.596         0.999         0.048         0.074           F17         2018         0.253         0.362         1.213         0.142         0.173           F19         2018         0.400         0.412         11.696         0.046         0.109           F20         2018         0.400         0.412	F <sub>6</sub>	2018	0.109	0.567	1.462	0.148	0.074
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>7</sub>	2018	0.290	0.350	3.228	1.123	0.146
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$F_8$	2018	0.209	0.436	1.703	0.480	0.074
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>9</sub>	2018	0.090	0.623	1.272	0.519	0.163
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$F_{10}$	2018	0.071	0.541	9.467	0.082	0.078
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$F_{11}$	2018	0.462	0.112	1.629	0.129	0.107
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$F_{12}$	2018	0.128	0.354	3.268	0.035	0.090
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$F_{13}$	2018	0.287	0.555	2.310	0.005	0.030
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$F_{14}$	2018	0.177	0.277	11.390	0.203	0.072
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>15</sub>	2018	0.080	0.228	0.234	0.022	0.070
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>16</sub>	2018	0.696	0.596	0.999	0.048	0.074
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>17</sub>	2018	0.253	0.362	1.213	0.142	0.173
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>18</sub>	2018	0.173	0.564	2.086	0.394	0.691
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>19</sub>	2018	0.400	0.412	11.696	0.046	0.109
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$F_{20}$	2018	0.140	0.580	2.516	0.074	0.189
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>21</sub>	2018	0.440	0.151	2.276	0.035	0.031
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$F_{22}$	2018	0.049	0.395	6.151	0.011	0.090
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$F_{23}$	2018	0.185	0.296	7.064	1.178	0.476
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$F_{24}$	2018	0.399	0.402	0.782	0.164	0.462
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$F_{25}$	2018	0.147	0.459	4.325	0.183	0.401
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>26</sub>	2018	0.177	0.284	5.889	0.037	0.400
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>27</sub>	2018	0.206	0.241	2.254	0.054	0.209
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>28</sub>	2018	0.112	0.402	4.647	0.100	0.173
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>29</sub>	2018	0.101	0.773	8.147	0.044	0.099
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>30</sub>	2018	0.397	0.646	3.083	0.021	0.128
F <sub>33</sub> 2018         0.095         0.146         8.165         0.017         0.083           F <sub>34</sub> 2018         0.189         0.199         3.589         0.082         0.217           F <sub>35</sub> 2018         0.565         0.773         3.513         0.158         0.696           F <sub>36</sub> 2018         0.295         0.165         3.545         0.091         0.253           F <sub>1</sub> 2019         0.176         0.173         2.046         0.019         0.306           F <sub>2</sub> 2019         0.141         0.346         2.644         0.129         0.362           F <sub>3</sub> 2019         0.300         0.277         1.902         0.017         0.466	F <sub>31</sub>	2018	0.230	0.541	0.806	0.021	0.096
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>32</sub>	2018	0.341	0.523	0.929	0.213	0.287
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>33</sub>	2018	0.095	0.146	8.165	0.017	0.083
F36         2018         0.295         0.165         3.545         0.091         0.253           F1         2019         0.176         0.173         2.046         0.019         0.306           F2         2019         0.141         0.346         2.644         0.129         0.362           F3         2019         0.300         0.277         1.902         0.017         0.466	F <sub>34</sub>	2018	0.189	0.199	3.589	0.082	0.217
F1     2019     0.176     0.173     2.046     0.019     0.306       F2     2019     0.141     0.346     2.644     0.129     0.362       F3     2019     0.300     0.277     1.902     0.017     0.466	F <sub>35</sub>	2018	0.565	0.773	3.513	0.158	0.696
F2     2019     0.141     0.346     2.644     0.129     0.362       F3     2019     0.300     0.277     1.902     0.017     0.466	F <sub>36</sub>	2018	0.295	0.165	3.545	0.091	0.253
F <sub>3</sub> 2019 0.300 0.277 1.902 0.017 0.466	F <sub>1</sub>	2019	0.176	0.173	2.046	0.019	0.306
7	F <sub>2</sub>	2019	0.141	0.346	2.644	0.129	0.362
F <sub>4</sub>   2019   0.515   0.460   1.542   0.288   0.271	F <sub>3</sub>	2019	0.300	0.277	1.902	0.017	0.466
	F <sub>4</sub>	2019	0.515	0.460	1.542	0.288	0.271

$\begin{array}{c ccccccccccccccccccccccccccccccccccc$							
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		2019	0.066	0.824	1.269	0.034	0.440
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$F_6$	2019	0.208	0.260	2.402	0.041	0.242
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>7</sub>	2019	0.398	0.139	3.476	0.622	0.074
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>8</sub>	2019	0.176	0.708	1.739	0.514	0.111
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>9</sub>	2019	0.156	0.619	2.680	0.586	0.090
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>10</sub>	2019	0.115	0.110	2.213	0.996	0.123
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>11</sub>	2019	0.122	0.582	2.099	6.006	0.066
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>12</sub>	2019	0.115	0.522	3.709	0.667	0.139
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>13</sub>	2019	0.361	0.131	1.658	0.515	0.125
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>14</sub>	2019	0.407	0.885	1.415	0.405	0.118
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>15</sub>	2019	0.337	0.478	1.880	0.095	0.084
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>16</sub>	2019	0.128	0.359	0.911	0.034	0.041
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>17</sub>	2019	0.234	0.838	1.314	0.245	0.083
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>18</sub>	2019	0.762	0.275	2.112	0.039	0.089
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>19</sub>	2019	0.012	0.642	1.585	0.097	0.117
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$F_{20}$	2019	0.171	0.606	1.766	0.259	0.152
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>21</sub>	2019	0.103	0.659	3.643	0.729	0.550
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$F_{22}$	2019	0.021	0.612	0.941	0.064	0.147
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$F_{23}$	2019	0.708	0.564	1.681	0.132	0.185
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>24</sub>	2019	0.269	0.603	9.477	0.033	0.049
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>25</sub>	2019	0.038	0.435	4.952	0.041	0.112
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>26</sub>	2019	0.001	0.427	1.546	0.748	0.415
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>27</sub>	2019	0.001	0.481	9.048	0.070	0.397
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$F_{28}$	2019	0.350	0.696	12.063	0.319	0.177
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>29</sub>	2019	0.047	0.704	8.859	0.040	0.141
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>30</sub>	2019	0.000	0.453	1.857	0.153	0.206
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>31</sub>	2019	0.000	0.754	0.922	0.034	0.176
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>32</sub>	2019	0.046	0.788	0.465	0.030	0.095
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>33</sub>	2019	0.006	0.459	1.171	0.013	0.230
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>34</sub>	2019	0.050	0.843	0.496	0.032	0.189
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>35</sub>	2019	0.002	0.821	2.206	0.063	0.341
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	F <sub>36</sub>	2019	0.276	0.760	0.870	0.059	0.101
F3         2020         0.102         0.185         1.481         0.032         0.295           F4         2020         0.004         0.087         6.491         0.001         0.015           F5         2020         0.150         0.062         1.199         0.157         0.399           F6         2020         0.058         0.050         1.110         0.001         0.010		2020	0.052	0.156	2.085	0.071	0.198
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	$F_2$	2020	0.012	0.334	1.887	0.086	0.565
F5         2020         0.150         0.062         1.199         0.157         0.399           F6         2020         0.058         0.050         1.110         0.001         0.010	F <sub>3</sub>	2020	0.102	0.185	1.481	0.032	0.295
F6         2020         0.058         0.050         1.110         0.001         0.010	F <sub>4</sub>	2020	0.004	0.087	6.491	0.001	0.015
7000 0000	F <sub>5</sub>	2020	0.150	0.062	1.199	0.157	0.399
	F <sub>6</sub>	2020	0.058	0.050	1.110	0.001	0.010
F7         2020         0.011         0.085         3.943         0.314         0.269	F <sub>7</sub>	2020	0.011	0.085	3.943	0.314	0.269

F <sub>8</sub>	2020	0.037	0.106	7.979	0.052	0.515
F9	2020	0.007	0.029	2.267	0.022	0.176
F <sub>10</sub>	2020	0.014	0.254	11.376	1.340	0.123
$F_{11}$	2020	0.021	0.273	11.435	1.459	0.168
F <sub>12</sub>	2020	0.007	0.311	2.982	0.812	0.120
F <sub>13</sub>	2020	0.006	0.234	3.655	0.517	0.126
$F_{14}$	2020	0.002	0.155	3.538	0.057	0.074
F <sub>15</sub>	2020	0.206	0.067	3.097	0.473	0.146
F <sub>16</sub>	2020	0.035	0.144	1.122	0.179	0.139
F <sub>17</sub>	2020	0.014	0.376	3.585	0.414	0.142
F <sub>18</sub>	2020	0.006	0.163	4.985	0.254	0.124
F <sub>19</sub>	2020	0.040	0.603	1.699	0.024	0.028
$F_{20}$	2020	0.047	0.453	5.303	0.619	0.119
F <sub>21</sub>	2020	0.074	0.333	7.151	0.046	0.047
$F_{22}$	2020	0.151	0.259	1.037	0.081	0.109
$F_{23}$	2020	0.013	0.227	4.194	0.526	0.149
F <sub>24</sub>	2020	0.003	0.269	7.542	0.362	0.441
F <sub>25</sub>	2020	0.074	0.373	3.133	0.283	0.176
F <sub>26</sub>	2020	0.654	0.166	3.077	0.096	0.208
F <sub>27</sub>	2020	0.144	0.306	4.405	0.022	0.066
F <sub>28</sub>	2020	0.296	0.117	3.159	0.048	0.122
F <sub>29</sub>	2020	0.356	0.280	4.057	1.027	0.354
F <sub>30</sub>	2020	0.231	0.117	3.147	0.272	0.361
F <sub>31</sub>	2020	0.231	0.111	7.451	0.088	0.156
F <sub>32</sub>	2020	0.994	0.131	0.947	0.024	0.103
F <sub>33</sub>	2020	0.168	0.154	0.541	0.032	0.115
F <sub>34</sub>	2020	0.665	0.092	0.602	0.026	0.171
F <sub>35</sub>	2020	0.042	0.233	0.372	0.021	0.128
F <sub>36</sub>	2020	0.028	0.105	0.766	0.053	0.407
F <sub>1</sub>	2021	0.457	0.186	3.776	0.034	0.234
F <sub>2</sub>	2021	0.358	0.218	2.847	0.059	0.337
F <sub>3</sub>	2021	0.394	0.414	2.325	0.026	0.115
F <sub>4</sub>	2021	0.341	0.161	5.677	0.097	0.163
F <sub>5</sub>	2021	0.388	0.069	1.883	0.118	0.762
F <sub>6</sub>	2021	0.436	0.208	2.486	0.041	0.240
F <sub>7</sub>	2021	0.397	0.037	0.212	0.001	0.026
F <sub>8</sub>	2021	0.565	0.086	2.736	0.177	0.398
F <sub>9</sub>	2021	0.573	0.192	7.099	0.005	0.014
$F_{10}$	2021	0.519	0.562	1.234	0.116	0.258

F <sub>11</sub>	2021	0.304	0.196	1.742	0.024	0.708
F <sub>12</sub>	2021	0.296	0.116	0.361	0.005	0.046
F <sub>13</sub>	2021	0.547	0.047	4.053	2.738	0.219
F <sub>14</sub>	2021	0.246	0.042	2.590	0.792	0.130
F <sub>15</sub>	2021	0.212	0.121	4.298	0.899	0.084
F <sub>16</sub>	2021	0.541	0.142	1.678	0.543	0.108
F <sub>17</sub>	2021	0.157	0.745	0.921	0.305	0.077
F <sub>18</sub>	2021	0.179	0.019	1.805	0.417	0.157
F <sub>19</sub>	2021	0.240	0.243	2.899	0.262	0.160
F <sub>20</sub>	2021	0.844	0.205	0.164	0.629	0.112
F <sub>21</sub>	2021	0.666	0.012	0.841	0.257	0.105
F <sub>22</sub>	2021	0.815	0.089	2.102	0.015	0.019
F <sub>23</sub>	2021	0.913	0.065	0.501	0.427	0.158
F <sub>24</sub>	2021	0.938	0.018	0.804	0.013	0.028
F <sub>25</sub>	2021	0.950	0.027	0.256	0.489	0.109
F <sub>26</sub>	2021	0.915	0.066	0.352	0.316	0.150
F <sub>27</sub>	2021	0.894	0.490	1.039	0.163	0.344
F <sub>28</sub>	2021	0.971	0.202	0.284	0.158	0.161
F <sub>29</sub>	2021	0.746	0.025	0.757	0.094	0.138
F <sub>30</sub>	2021	0.727	0.165	3.894	0.206	0.139
F <sub>31</sub>	2021	0.689	0.198	7.643	0.016	0.116
F <sub>32</sub>	2021	0.766	0.205	1.551	0.681	0.335
F <sub>33</sub>	2021	0.845	0.084	4.243	0.070	0.288
F <sub>34</sub>	2021	0.933	0.210	2.769	0.082	0.197
F <sub>35</sub>	2021	0.856	0.261	3.386	0.008	0.079
F <sub>36</sub>	2021	0.624	0.065	4.672	0.105	0.118