

The Impact of Earnings Management on Innovation Strategies in Developed, Developing, and Transition Economies.

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1. Abstract

This study focuses on investigating the impact of earnings management on innovation strategies in developed, developing and transition economies. The study examines earnings management models and utilises accruals models: standard Jones model ([Dechow and Sloan, 1991](#)), Modified Jones model ([Dechow et al., 1995](#)), Kothari model ([Kothari et al., 2005](#)) working capital Peasnell model ([Peasnell et al., 2000](#))

and real activities models ([Roychowdhury, 2006](#)): abnormal production, abnormal cash flow, and abnormal discretionary expenses. Under accruals models, this research examines how accruals utilise both the balance sheet and cash flow approach. A quantitative approach is adopted for this research as well as adopts linear regression and independent t-test, Mann-Whitney U test. The data sample is drawn from 36,777 firms from 2008 through 2018.

Earnings management mainly affects earnings reports and, thus, the stockholders and potential investors who use the earnings report to decide whether to invest or continue to invest in a firm. There are various ways that allow executives to manipulate the earnings reports, such as real activities and the use of accruals. On the one hand, innovation is associated with the uncertainty of future economic benefit. As well, executives are under pressure to consistently provide the desired funds for innovation, precisely where a research and development strategy is embraced. On the other hand, Executives are also under pressure to meet earnings expectations. To do so, executives use earnings management. This study fills the gap in the literature regarding earnings management and innovation strategies. The results show that executives in innovated firms are not equally engaged in earnings manipulation in non-innovated firms in developed, developing and transition economies. In addition, the research found a strong relationship between earnings management and innovation strategies. Accruals manipulations in developed, developing economies have a positive relationship with

innovation, and transition economies have a significant positive relationship with innovation in the working capital model only. Real activities, abnormal production, abnormal cash flow, and abnormal discretionary expenses manipulations have a positive relationship with innovation in developed, developing economies and positive relationship in transition economies. These positive relationships when they exist between earnings management models and innovation suggest that executives do manipulate the financial statement in order to support innovation strategy.

Also, we find that abnormal production model is preferred by executives in innovated and non-innovated firms over accruals in abnormal production only, but accruals are preferred over abnormal discretionary expenses and abnormal cash flow. These results highlight that there is no preferred method, but executives utilised both approaches in order to achieve their incentives.

Also, these results documented the similarity of executives' approach concerning managing earning and innovations in both developed and developing economies. Likewise, it provides evidence for stakeholders of the importance of earnings management and executives 'strategies when pursuing innovation. It also provides pieces of evidence on which approach and models are more robust to detect earnings management in developed, developing and transition economies.

We also find that the power of models in accruals is different based on total accruals calculation methods. We find that the balance sheet approach is more potent than the cash flow approach. Correspondingly, abnormal production is a more robust model for explaining earnings management in developed, developing and transition economies. These finding could be beneficial to executives, investors, and policymakers in regard to decisions about innovation strategies and the earnings management tools. Finally, the results could be helpful

for future research on accruals, real activities and innovation in developed, developing and transition economies.

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May Allah bless all

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1. Chapter One:

1.1 Introduction

Preliminary research evidence indicates that there are two methods of earnings management utilised by firms in the execution of their innovation strategies and objectives. ([Jeppson and Nathan 2012](#)) shows that firms undertaking innovation are more likely to manage earnings because of and depending on several theoretical perspectives; they attempt this by either accrual-based or real activity-based earnings management. For instance, theorists of earnings management in firms indicate that the method is useful to such firms because of their need for pools of working capital to propel new projects. Additionally, firms undertaking innovation may face adverse price reactions if they are unable to reach earnings thresholds, thus providing another theory and need for earnings management.

This research thus seeks to present a comprehensive study of the impact of earnings management on innovation strategy in innovative firms in developed, developing and transition economies. Preliminary results indicate that, depending on the rate of innovation in a firm, earnings management methods, for instance, accrual-based, are utilised. The higher the innovation orientation in a firm, the more likely it is to utilise accrual-based earnings management to direct innovation strategy. In contrast, firms undertaking less innovation utilise little accrual-based earnings management. Therefore, this research seeks to investigate this assumption.

The analysis begins by discussing the earnings managements in prior research. The researcher critically analysed and the compared earnings management models of [Healy \(1985\)](#), [Jones \(1991\)](#), [Chaney and Lewis \(1995\)](#), [Dechow et al. \(1995\)](#), [Deangelo \(1986\)](#), [Peasnell et al. \(2000\)](#), and [Roychowdhury \(2006\)](#), [Kothari et al. \(2005\)](#).

The study provides a picture of the differences and similarities of each model; and how the definition of accruals impacts each model. Also, understanding earnings management in each economy is essential as it can potentially provide an understanding of executives' manipulation in each economy and could lead stakeholders, such as auditors and investors, to understand the earnings management in each economy.

In Chapter 2 and 3, the literature review discusses the earnings management and the innovation and its relationship with earnings management, which includes the background of earnings management and executives'

Chapter 5 discusses the reason of selecting the qualitative method over other methods as well as the selection of the data and models employed in this PhD to investigate the relationship and the impact of earnings management in innovated firms in developed, developing and transition economies. It also discusses the development of the hypotheses and the control variables employed in this research.

Chapter 6 discusses the empirical results, including descriptive data and data regression analysis. In addition, the chapter discusses whether the data analysis agrees with the research hypotheses. It also includes the contribution of this research to the academic and non-academic worlds.

1.2 Background

Knowledge advancement in business development informs that innovation is the single most important avenue to fuel a firm's growth and development and maximise its shareholders' interests and returns. According to research evidence, firms that are termed as globally successful are so because they engage in innovation and dedicate considerable time and money to innovation, growth and development strategies [Hsu \(2017\)](#). Engaging in innovation allows a firm the opportunity to raise new income, improve operational efficiency and enhance productivity. While there is much promise in engaging in innovation, researchers in the field warn that there is a great deal to consider for a firm to engage in innovation successfully. According to [Jackson \(2017\)](#), the decision to innovate involves consultation between or among executives on how best to approach innovation. They can choose to develop an in-house, research and development, that will be the brain of all innovation in the firm or, alternatively, they can choose to purchase new patented ideas from outside and develop them as firm-owned or have both an in-house research and development team while sourcing for exceptional and viable ideas outside too.

[Gunday et al. \(2011\)](#) showed that investing in in-house -research and development -involves the allocation of considerable capital to this new firm organ. According to [Gunday et al. \(2011\)](#), this route to innovation involves the long-term commitment of a firm to continue providing support and capital to the research and development organ to ensure that it progresses with its duties of devising plans to progress the firm to newer heights in the future. Apart from just pumping extensive capital into the research and development department, the firm's executives at the drawing board have to be futuristic enough to guarantee that the firm is in position to generate a large amount of capital from its ongoing activities. On the other hand, when firms choose to purchase already realised innovations in the form of patents from external sources, it becomes cheaper in the sense that the management of the firm will not

necessarily have to commit to providing capital to the research and development department for a lengthy period. Therefore, by purchasing patents, a firm can save time and make money quicker by implementing already realised or mapped ideas and obtaining the sales value. In essence, [Gunday et al. \(2011\)](#) posited that it is easier to proceed with innovation through the patent acquisition route; especially if the firm is medium-sized. As far as financial prospects are concerned; This is because research and development entail considerable expense, including high set-up expenses, continuous capital injection, low collateral values and high termination costs because of the infrastructure built over the years.

The background research shows that different firms engage in different innovation strategies, which, in turn, affect the earnings management methods that the management adopts. According to research evidence, both accrual-based and real activity-based earnings management increase the opaqueness of financial reporting and transparency, while, at the same time, creating information asymmetry between market players and corporate executives ([Cohen and Zarowin, 2010](#)). The flexibility provided by the accrual-based earnings management methods allows firms to strategically manipulate the earnings reports, thus presenting an intended, better financial picture to shareholders and other market participants. On the other hand, real activity-based earnings management allows the firm executives to boost the revenue for sales by increasing discounts in prices, increasing ending inventories by decreasing the costs of goods sold and improving the overall reported earnings by slashing costs on discretionary spending ([Cohen and Zarowin, 2010](#)). Based on the above, it is clear that there is a decrease in reporting transparency occasioned by firm executives manoeuvring skills on real transactions. All these manipulations are aimed at influencing the investors, shareholders and other prospectors to invest more in the firm's innovative efforts. With that understanding, therefore, the researcher examined the effect and impact of earnings

management on innovation strategies in firms in developed, developing and transition economies.

1.3 Research Objectives:

This research seeks to examine the impact of earnings management in firms in developed, developing and transition economies. To achieve the aim, this PhD set out the objectives as follows.

What is the relationship or association between earnings management and innovation in a firm?

How does earning management impact or affect the innovation strategies adopted by a firm?

What do firm executives gain by manipulating the reporting using different earnings management methods?

In answering the above three questions, the research will have fulfilled its objectives, which include:

Understanding the relationship between innovation and earnings management in firms.
Reviewing and understanding the actual impact of earnings management on innovation strategies adopted by firms' executives.

1.4 Methodology

The overarching aim of this PhD research is to study the impact of earnings management methods on innovation strategies adopted by firms in developed, developing and transition economies. To achieve this aim, the researcher applied quantitative methodology of research and conducted in-depth research on the relationship between the innovation strategies and earnings management models utilised in a firm.

STATA and SPSS software were used in analysing the data. Firms were selected based on their innovation costs incurred during the selected periods and firm with no innovation. Regression analysis was employed as the primary multivariate analysis.

The Jones ([Jones](#)), Modified Jones ([Dechow et al.](#)), The Performance-Matching Model ([Kothari et al.](#)), Working Capital Model- Margin_ ([Peasnell et al.](#)) and Roychowdhury ([Roychowdhury](#)) models were employed to estimate the earnings management for each firm. The data for these models, such as revenue, cash flow, accounts receivable and total assets, were collected from the OSIRIS database for all economies for the period of 2010 to 2018 and then analysed. As advised by Harrison ([Harrison](#)), the researcher utilised descriptive data analysis approaches to analyse the quantitative data collected from the research. The researcher then utilised the result of analysing the models above to examine the relationship with innovation in developed, developing and transition economies.

2. Chapter Two: Earnings Management Chapter

2.1 Introduction

This chapter is intended to present the earnings management models and the international development thereof and to attempt to understand its trends and develop its theoretical and conceptual frameworks within different national and international contexts.

This chapter will begin with the earnings management concept, then discuss earnings management motivations; This will offer a clarification of executives' incentives and the decisions taken firms, what they are trying to achieve, and whether this accomplishment is personal or not.

Next, the chapter discusses earnings management and cultural impacts, which is intended to clarify earnings management across the world and find whether there are differences and similarity. It then provides an explanation of earnings management models, which intends to provide ways of indicating whether there is earnings management in a firm or not. Most models have been used, criticised and improved over the years, but they are still acceptable tools in the academic world.

2.2 Earnings Management Concept:

Earnings management through the last century has been documented by numerous studies, specifically, those focusing on the accrual's manipulations. According to [Armstrong \(1993\)](#)), The earnings management concept is one of the most essential ethics for financial reporting and has attracted many researchers. However, as yet, there has been no universal agreement among scholars in defining the EM concepts. The level of disagreement is rather conceptual, not only related to the procedures, but to the process of managing the earnings favourably ([Healy and Wahlen, 1999](#), [McNichols, 2000](#), [Ronen, 2008](#))

Firstly, [Healy and Wahlen \(1999\)](#) suggested that earnings management is a management decision which is intended to achieve a predictable outcome when executives utilise their professional judgements to misinform shareholders about firm performance. [Mulford \(2005\)](#) implied that management aims to accomplish particular objectives set by internal and external parties, while [Phillips et al. \(2003\)](#) pointed out that earnings management is manipulating the cash flow and accounting choices. [Ronen \(2008\)](#) classified earnings management as follows: When management utilises earnings management to enhance the reporting, when managers utilise earnings management to manipulate the reports within standards and, lastly, when managers utilise earnings management to misrepresent facts and commit fraud. [Dechow and Skinner \(2000\)](#) stated that earnings management is a professional judgement by management that is aggressive, but acceptable and not fraudulent, while [Schipper \(1989\)](#), defined it as management disclosure in order to achieve personal gain. According to [Phillips et al. \(2003\)](#), earnings management is accounting selection and/or operating the cash flow in a firm. Whereas [Giroux \(2004\)](#) held that it is a process whereby executives have control over the financial reporting system in order to accomplish executives' compensations; and, finally, [Roychowdhury \(2006\)](#) stated that earnings management is executive practices that differ from reasonable business practices.

To conclude, In the literature, these have been extensively investigated in an attempt to define earnings management, previous studies provide various definitions that mainly consider earnings management as the manipulation of the financial statements of a firm to achieve certain objectives significantly. These researches imply manipulation of financial reporting is about management's ability to utilise various tools, specifically the use of professional judgements, such as accounting policies and discretionary accruals. One can understand the following: First, executives are able to utilise professional judgement in financial reports in different ways, such as the expected useful life of an asset, the value of long-term assets,

deferral tax and losses from bad debts. Second, executives are able to utilise the acceptable accounting methods for recording the same transactions, such as LIFO and FIFO. Third, managers utilise judgements in working capital management, such as the inventory level and the time of shipping the inventory. Fourth, executives are able to defer expenditures, such as research and development ([Healy and Wahlen, 1999](#)). These scenarios are controlled by executives through accounting choices within GAAP or making decisions related to business activities. Therefore, the researcher concluded that earnings management is the ability of executives to influence the outcome of the financial report, whether by utilising accounting standards or operational decisions in their favour.

2.3 Accounting choices

Some may argue that the purpose of accounting choices is to influence the outcome of the financial statements and the accounting system in a specific direction. However, according to the International Accounting Standard ([IASB](#)), the main reason for accounting is to supply information about the entity to stakeholders, such as investors, regulators and decision-makers. The result of accounting choices by executives is shown in the financial statements. Executives have numerous choices to select based on their inside information of firms; however, they could select specific choices to influence the outcome to certain directions. These decisions and choices are based on transaction cost. To illustrate, firms that report losses could send a negative signal to creditors and investors, which will have a direct impact on the firm's credit rating ([Dechow and Skinner, 2000](#)). However, the market reacts differently to such a signal based on many factors, such as previous signals. According to [Burgstahler and Dichev \(1997\)](#), executives tend to increase earnings above or to zero levels in order to avoid transaction cost with shareholders. However, accounting standards limit executives' choices and monitor their selections by rules.

Nevertheless, there are limitations as to what standards can do; for example, there is no standard to enforce executives to reduce the sales discount if they choose not to. The accounting choices have been discussed in prior studies under different approaches, such as earnings management, significant bath accounting, and income smoothing. [Fields et al. \(2001\)](#) documented accounting choices as any decision made so as to influence the accounting system using not only GAAP but tax regulatory. PAT theory by ([Watts and Zimmerman, 1986](#)) was structured under the umbrella of accounting choices. Concerning executives' accounting choices, these are most likely to be incurred based on three hypotheses:

- Executives' accounting choices tend to shift future income to the current period when there is a bonus payout in the current period.
- Executives' accounting choices tend to increase income to avoid debt covenant.
- Executives' accounting choices tend to select conservative choices to maximise firm value.

In summary, accounting choices are a part of earnings management, but not all the manipulations. Executives utilise the accounting choices in order to achieve different incentives, such as personal incentives or firms incentives.

2.4 Earnings Management Motivations

Shareholders recognise that the executives make the decisions in organisations, but these may not represent the best interests of the shareholders. Both shareholders and managers take actions intended to serve their own best interests. Several studies such as ([Omonuk, 2007](#), [Almasarwah, 2015](#)) have claimed that executives engage in earnings management opportunistically to shift revenue and expenses in different reporting periods in order to achieve gains for their benefit. According to [Demski \(2008\)](#), opportunistic earnings management occurs due to conflict of interest as the executives who hold the most information utilise it to their advantage at the expense of others. One of the most important studies, [Jiraporn et al. \(2008\)](#) examined earnings management motivations to distinguish between beneficial and opportunistic motivations. Opportunistic is when executives alter the financial reports in order to influence negative performance. [Adut et al. \(2013\)](#) documented executives' decisions in accounting choices related to CEOs compensations, while other studies examined the relationship between executives' compensations.

Similarly, [Healy \(1985\)](#), ([Deangelo, 1986](#), [Holthausen et al., 1995](#)) indicated that executives engaged in earnings management in order to achieve personal gains. [Watts and Zimmerman \(1990\)](#), [Guay et al. \(1996\)](#), [Arya et al. \(2003\)](#) have indicated that earnings management could be beneficial due to the information value, as executives have the option to communicate private information to stockholders and the public. Executives utilise earnings management to achieve particular aims, for instance, market positions, higher EPS, and when maximising might not align with the firm's objectives. This section introduces some of the motivations discussed by prior studies.

FIGURE 2.1. Earnings management motivations.



2.4.1 Compensations and payout.

Bonus, salaries, share options, and restricted stock are examples of forms of compensation and pay-out that executives receive in exchange for the services provided during specific periods. [Healy \(1985\)](#) found that executives participate in earnings management to increase their payout. Under the PAT theory, He documented evidence that executives increase the net income in the period of compensation payout. In addition, [Deangelo \(1986\)](#) presented evidence that executives participate in earnings management in order to earn bonuses and present the high performance of their firms in order to retain their jobs. [Cheng and Warfield \(2005\)](#) examined the relationship between earnings management and executives' equity incentives and documented that executives with high compensation are likely to report earnings that meet or exceed, but which are not mostly positive, expectations of the analysts. [Efendi et al. \(2007\)](#) also examined firms during the 1990s market bubble. The study documented that executives at firms with stock options managed earnings. Another study by [Bergstresser and Philippon \(2006\)](#) indicated that executives are likely to utilise accruals when compensations are linked to the stock. A more recent study

by [Zhou et al. \(2018\)](#), examined the change in payout for executives and earnings management. The importance of this study is that Zhou examined real activities manipulation as well as accruals manipulation using Chinese public firms. The findings of the study supported prior studies in terms of the existence of the relationship between compensation and earnings management. The surprising result also indicates that CFOs engage in earnings management as a result of CEO pressure. Chinese firms utilise real activities as a substitute for accruals earnings management since the auditors and regulators are more influential in China.

2.4.2 Capital market.

Meeting analysts expectation of earnings is one of the essential tasks on executives' minds. Most of the studies in this area suggest that the executive's primary motivation is to increase the share price of the firm, as a result, will boost executives' credibility for meeting analysts expectations. [McNichols \(2000\)](#), [McNichols and Stubben \(2008\)](#) indicated that internal decisions, such as capital investment in the firms, are influenced by earnings management since there is a gap between analysts' expectations and firm performance. [Hribar et al. \(2006\)](#) investigated executives' decision when firms utilised stock repurchases programmes in order to meet analysts' earnings per share. The study examined 26,480 US firms which repurchased their shares. The study documented that executives repurchase the stock in order to beat analysts' expectations. [Bartov et al. \(2002\)](#) argued that firms that meet analysts' expectations have higher stock options.

In contrast, stock prices decline for firms do not meet analysts' expectations [Bartov et al. \(2002\)](#) indicated that management utilises earnings management to meet analysts' and stakeholders' predictions by examining firms between 1993 and 1997 for 65,000 firms. [Brown \(2001\)](#) and [Koh et al. \(2008\)](#) documented that firms' earnings are exactly as analyst expectations. Another [Burgstahler \(1997\)](#) documented that firms avoid losses by utilising

earnings management so as to influence analysts' forecasts. These kinds of influences are also documented in different studies, such as [Soffer et al. \(2000\)](#). The latter presented evidence of firms' stock price has declined as a result of executives warning investors about upcoming unfavourable disclosure.

2.4.3 Research and development.

Reduction of expenditure is one of the tools that executives select in order to achieve their target. Since the reduction of expenditure has a direct impact on current earnings, it may have more impact on future earnings. Expenditure such as marketing expenses and research and development are general expenses favoured by executives who tend to manipulate the outcome of the financial reports. [Cheng \(2004\)](#) indicated that executives reduce spending, specifically in research and development, in order to accomplish their aims. [Baber et al. \(1991\)](#) examined US firms in the period of 1977 -1987 and found that executives reduce the research and development to increase earnings. [Bange and De Bondt \(1998\)](#) examined the relationship between earnings targets and earnings management by reducing the research and development costs and found that executives tend to utilise research and development in order to meet their earnings. They investigated firms in the US and found that executives reduced research and development spending for different objectives, for instance, executives' incentives, funds and taxes. The study also hypothesised that reducing research and development could be a result of externalities, such as market pressure to change the project. Another study by [Oswald and Zarowin \(2007\)](#) investigated executives' decisions impact on capitalising research and development in UK firms. The research found that firms' decision to capitalise research and development expenditure was linked to stock price. Executives reduced research and development by capitalising research and development expenditure, which decreased their expenses and increased their earnings as well, signalling the market as to future earnings. Other studies, such as [Lev and Sougiannis \(1996\)](#) [Leone and Rock \(2002\)](#) and, [Roychowdhury](#)

[\(2006\)](#) have presented substantial evidence of reduction or increase of research and development expenditure as a tool of earnings manipulation. The increasing research and development expenditure could be tied to the reduction of tax and taking advantage of research and development credits. On the other hand, the reduction of research expenditure could be tied to the increase in income targets.

2.4.4 Political cost.

Political cost impacts executives' decisions when they select accounting policy, especially when the earnings are transferred from firms to other parties. Executives choose to downgrade earnings in order to avoid regulatory actions. [Bergstresser and Philippon \(2006\)](#) provided evidence that earnings management strongly exists in countries where the legal system and enforcement are not sufficient. The study shows that, in countries with a highly developed market, public firms are less involved in earnings management. [Gill-de-Albornoz and Illueca \(2005\)](#) studied firms from 1991-2011 and provided strong evidence on the relationship between earnings management when tariffs increase. The study employed discretionary accruals models, the standard Jones model, the Jones cash flow model, the accounting process model and the marginal model, all of which provided significant reliable results. Another study [Cho and Sachs \(2012\)](#) investigated firms during the US deregulated motor industry, the results of which were consistent with prior researches. It documented evidence that executives decreased earnings in the deregulated period. [Han and Wang \(1998\)](#) examined firms' decisions during the 1990 Gulf Crisis and indicated that executives decreased quarterly earnings to gain from the crisis. However, these firms reported higher earnings prior to the decreased earnings. The study suggested that higher earnings reporting was due to being weighted by the political costs.

2.4.5 Earnings.

Prior studies have provided evidence of executives' motivation when they manage earnings; scholars have indicated that executives manipulate the financial reports in order to beat the earning benchmarks, avoid losses and avoid negative surprises. *'I find evidence consistent with managers manipulating real activities to avoid reporting annual losses'* ([Roychowdhury, 2006](#)). Earnings management is an essential issue in financial reporting when executives manipulate the outcome of reporting incomes. [Degeorge et al. \(1999\)](#) indicated that executives concern about earnings at three levels. First, positive earnings, above zero, second, the sustainability of earnings for each year, and, lastly, to meet earnings expectation by analysts. The study documented strong evidence that executives in firms that fell short in meeting earnings, managed earnings upwards. Also, executives manage earnings to meet analysts' expectation once earnings are positive. [McNichols and Wilson \(1988\)](#) provided detailed evidence on executives' manipulation of financial reports through bad-debt expenses by selecting income–decrease accruals.

2.4.6 Taxation.

Many pieces of research have investigated the relationship between earnings management and aggressive tax. Some researcher such as [Brown et al. \(2009\)](#), indicated that executives are faced with decisions to tradeoff between higher reporting earnings and tax reporting decision. while others such as [Hines Jr and Desai \(2005\)](#) [Lisowsky \(2010\)](#), believe that the taxation regulations offer executives opportunities to manage earnings and report higher income, and lower taxable income. [Keating and L. Zimmerman \(1999\)](#) studied 4,000 firms for the period between 1972-1994. The paper provided empirical evidence that executives change depreciation policy in order to take advantage of tax laws. The study suggested that executives tend and prefer to change depreciation methods for newer assets. In addition, when executives increase earnings, either to meet analysts, for compensation and/or to avoid debt covenant,

they change the depreciation methods for both old and new assets. Another study by [Frank et al. \(2009\)](#) investigated 8,100 firms for the period 1991 to 2005. The study investigated the relationship between tax reporting and earnings management and found strong empirical evidence that firms' executives managed choice decisions that increased earnings and decreased taxable income in the same period.

Based on the above, the evidence presented in this section suggests that there are numerous motives for earnings management, which can be categorised into groups. Contract motivation arises when there are conflicts between executives and shareholders. Market motivation occurs when there are differences between the stock market value and the actual value of an organisation, i.e. "intrinsic value". External party motivation arises due to external influence, such as from a regulatory body and taxation.

2.5 Earnings Management and Cultural Factors across Countries

Each research in earnings management has to consider some specific vital elements, such as data and sampling. The selection of a sample from a specific geographical area is significant and useful to the researchers. [Robinson Jr and Green \(2011\)](#) indicated that the research on geographical perspectives provides knowledge to the researchers, especially for those who want to increase their knowledge and those who want to illustrate the relationship between countries, especially, developing countries. [Leuz et al. \(2003\)](#) selected a sample from European countries to deduct earnings management. The results of the study indicated that the legal system in a country impacts the level of earnings management. Put differently, earnings management in a country with a weak legal system in terms of protecting the investor is more prevalent. [Geiger and North \(2006\)](#) indicated that earnings management practices vary among countries. [Callao et al. \(2014\)](#) indicated that the earnings management literature is based on

firstly, one country, which presents whether earnings management exists or not. In these studies, it mostly occurs in response to a situation. For instance, [Li \(2016\)](#) studied the impact of the Sarbanes-Oxley Act on earnings management in one country, the US. In Europe, [Markarian et al. \(2008\)](#) examined Italian firms and [Yagüe et al. \(2009\)](#) examined Spanish firms. In Asia, [Haniffa et al. \(2006\)](#) and [Almasarwah \(2015\)](#) examined firms in Jordan.

[Callao et al. \(2014\)](#) provided an analysis on the studies of earnings management based on one specific country; the study showed that one study was done in Canada and 99 studies were in the United States of America, which is the location for almost 60% of all studies around the globe. Asia is the second with 22%, Europe has 19%, South America 2% and Australia 1%. Second, studies of earnings management are based on one, two or three countries, and deduce the similarities and differences between the countries selected. Third, studies of earnings management based on one set of countries, more than three, by which to deduct the earnings among the countries.

According to [Bourdieu \(1977\)](#)), culture is about distinguishing between what is wrong and what is good, what is desirable and right in society. [Desender et al. \(2011\)](#) examined the effect of individualism and egalitarianism on earnings management in different cultures. [Desender et al. \(2011\)](#) study on firms from thirty-one countries in the period of 1990 to 1999, it indicated that lower levels of earnings management were found in countries with higher levels of individualism. [Guan et al. \(2005\)](#)) investigated the impact of cultural values on earnings management among twenty-seven countries; the results were consistent with those of [Desender et al. \(2011\)](#), with a masculinity culture having a higher level of earnings management. [Nabar and Boonlert-U-Thai \(2007\)](#) provided evidence on the impact of cultures on earnings management and indicated that earnings management is linked with uncertainty avoidance. Earnings management is higher in non-English-speaking countries.

Most countries in developed economies under Islamic faith have Sharia implemented in one way and another. Sharia is defined as a system of ethics and values that cover all aspects of life. As stated previously, [Armstrong \(1993\)](#) linked earnings management to ethical decisions, which means that economic decisions in these countries should not be isolated from Islamic values and beliefs. According to [Yusoff et al. \(2013\)](#), the purpose of Sharia is to ensure the interests of society are protected. Some studies have considered earnings management to be unethical behaviour since it misrepresents the financial position of a firm. These misrepresentations will mislead the shareholders and stakeholders. As a result, shareholders may decide to invest, or pullover and that will weaken the economy overall ([Obid and Demikha, 2011](#)). Also, a large number of studies have indicated that religions do impacts earnings management level; for instance, Christianity and Judaism are the most dominant religions in the developed economies. Both religions operate under the same assumption that individuals should not manipulate one another; This includes business practice as well. In both religions, there is no Sharia law, but the rules are the same in dealing with manipulation. All religions look unfavourably on deceiving society. [Stack and Kposowa \(2006\)](#) examined religion and tax manipulation and documented that there is a negative relationship. [Noussair et al. \(2013\)](#) found that Christians, specifically, Catholics and Protestant, differ in dealing with risk behaviour.

Similarly, [Jiang et al. \(2015\)](#) argued that eastern religions impact executives' results. However, these studies focused on religion failed to explain as to whether the ethical behaviour of executives was from religious values or culture and society values. In addition, some may look at earnings management as an imperative to encourage shareholder to invest in the economy, and there are no ethical issues; therefore, religion and culture should not be taken into consideration when examining earnings management.

Methods of Earnings Management

Executives utilise different approaches in order to alter financial reports. Generally, there are two main approaches, Real earnings management and accrual-based earnings management. Which tools that executives utilise in order to adjust certain transactions. Both are acceptable by the standards and do not result in any violation of generally accepted accounting principles ([Dechow et al., 2010](#)). Executives utilise the accrual method when they adjust either or both revenue and expenses. For instance, changing the depreciation methods, delaying assets write off, and underlining the bad debt expenses; as a result, accrual method has a direct impact on the balance sheet and income statement, but has less impact on cash flow. The second method executives utilise to alter the financial statements is real activities. This method can be categorised into operating, investing and financing [Al-Shattarat \(2017\)](#). For instance, reducing research and development, marketing expenditure, overproduction of inventories, and sales timing ([Roychowdhury, 2006](#)); providing more significant discount and lenient credit terms that will result in accelerating of sales ([Graham et al., 2005](#)); and the timing of disposal of assets and investments ([Bartov, 1993](#)). Executives may choose to manage earnings by employing more than one method at the same time. However, [Graham et al. \(2005\)](#) indicated that the accrual method represents more risks for the Security and Exchange Commission, especially when executives aggressively select accounting choices. [Cohen et al. \(2008\)](#) documented evidence on executives' behaviour and indicated that executives utilised real activities after the Sarbanes-Oxley Act 2002. [Zang \(2011\)](#) examined executives' choices in order to provide evidence as to whether executives utilise one method or both methods. The study found that executives' tradeoff between both methods based on their costs. [Chi et al.](#)

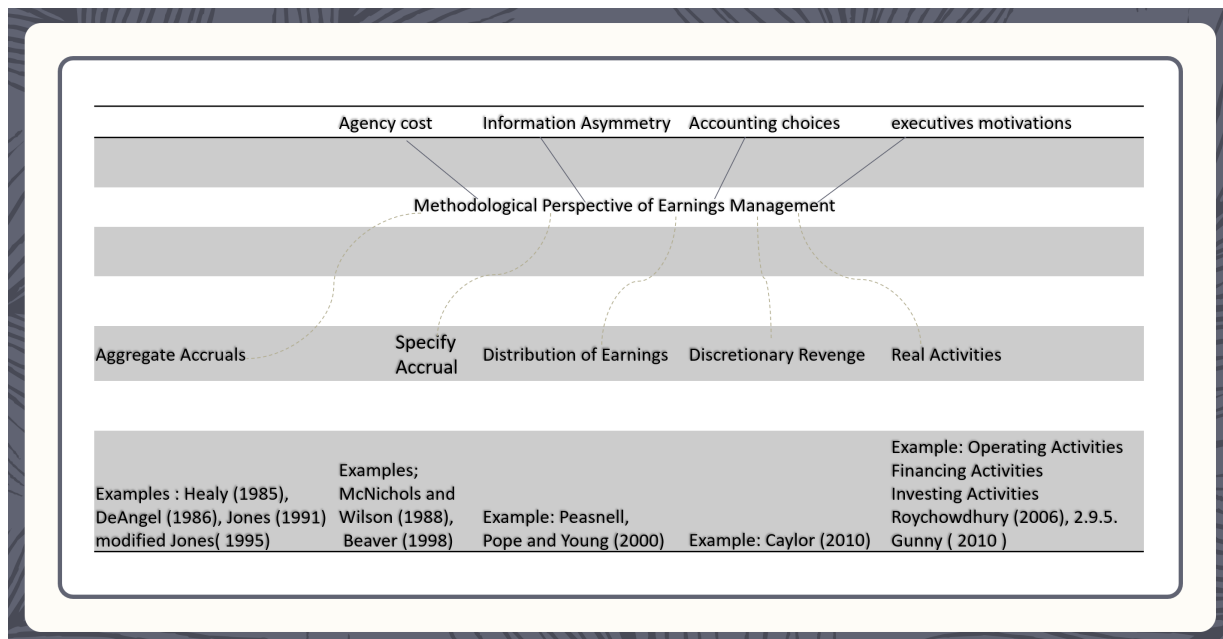
[\(2011\)](#) also examined executives' choices and documented that firms utilised real activities more when they are subject to audit by extraordinary excellence auditors.

On the other hand, executives may choose the accrual method over real activities, correctly, when there is need of managing earnings, executives often utilise accrual methods at the end of the period, whether year-end or quarterly. Executives cannot reduce expenditures at the end of the year; therefore, real activities must be exercised before the ending period. However, executives have no knowledge of the level of adjustment needed ([Al-Shattarat, 2017](#)).

2.6 Methodological Perspective of Earnings Management

Prior studies on earnings management success were based on the methodology that is used to measure the earnings; This is widely reported and extensively explored in the literature by [McNichols \(2000\)](#) and [Beneish \(2001\)](#). They provided three research designs that have been utilised by prior literature to measure and evaluate earnings management in a specific firm, which are aggregate accruals models that utilise regression models and specific accrual models which focus on the specific provision, for instance, bad debt, and statistical properties of earnings.

FIGURE 2.2. Earnings management structure.



2.6.1 Aggregate Accruals

Aggregate accrual studies have dominated and presented various models in order to provide a discretionary accrual apart from the total accrual of specific firms. These models have been examined widely in prior research as aggregate accrual measures all of the accrual components rather than a single account. According to aggregate accrual models, financial reports consist of two parts, cash and non-cash earnings – accrual-. Accruals are adjustments which have no direct impact on cash flow; as a result, reported earnings are total accruals and cash flow from operating ([Hribar and Collins, 2002](#)). Therefore, executives may manipulate earnings by either one or both components.

The total accrual side contains the discretionary accruals -unexpected- and non-discretionary accruals -expected-. Where the non-discretionary accruals part is isolated and not subject to executives' manipulations, which are driven by business activities, and firms require to be compliant by standards, for instance, firms are required to use depreciated assets -IAS 16-. On

the other hand, discretionary accruals are more subjective to manipulations by executives; for instance, executives can select the depreciation method, such as allocation of fixed overhead. Therefore, it is essential to distinguish between discretionary and non-discretionary. As a result, total accruals are earnings less cash flow from operating ([Healy, 1985](#)).

Nevertheless, accruals have changed over periods ([Dechow et al., 2010](#)). As a result, prior researches have measured the total accruals using balance sheet components ([Dechow et al., 2011](#)). [Hribar and Collins \(2002\)](#) indicated that the cash flow approach is more reliable than the balance sheet approach. The balance sheet approach considers the total accruals as the change in current assets, excluding cash items, minus the change in current liabilities, excluding the current portion of long-term accruals, and, finally, minus total depreciation. Since there is flexibility in calculating total accrual, some bias may incur and affect the result.

Financial Reports = Cash + Non-Cash Earnings

Non-Cash Earnings = Accruals

Report Earnings = Cash Flow from Operating + Total Accruals

Total Accruals = Discretionary + non-Discretionary

Non-Discretionary = not subject to Manipulation

Discretionary= subject to Manipulations

However, all of the aggregate accruals' models misclassified non-discretionary accruals as discretionary accruals ([Dechow et al., 2003](#)). The researcher identifies some papers that have significantly contributed to the measurement of accruals under aggregate accruals as following

2.6.1.1 Healy (1985)

[Watts and Zimmerman \(1978\)](#) suggested that the motivations of earnings management are political cost, debt covenant and bonus plan. Therefore, from [Watts and Zimmerman \(1978\)](#), [Healy \(1985\)](#) developed the model by examining the effect of bonus plan schemes on

accounting decisions using 94 firms and was the first researcher to present discretionary accruals to spot in earnings management. [Healy \(1985\)](#) proposed the primary hypothesis that executives' compensations affect their decisions in producing financial statements. Executives utilise either the accrual basis approach or changes in accounting methods in reaching their decisions. The outcome of the theory indicates that the executives systematically utilise accrual policies to maximise their future payout.

Prior literature on earnings management, for instance, [Collins et al. \(1981\)](#), [Holthausen \(1981\)](#), and, [Zmijewski and Hagerman \(1981\)](#) is different from [Healy \(1985\)](#) model, as they have assumed that executives will always tend to increase the earnings by using accounting procedures to enhance their payouts. On the other hand, [Healy \(1985\)](#) presented his model under the assumption that executives have the ability to select the accounting procedures that will increase their compensations, which may not increase the earnings, but decrease them, as the model assumes the executives' behaviours extend further than one period. However, when a firm's earnings are below thresholds, even after manipulation, in such a situation, executives' incentives convert to reducing the earnings further by using deferred revenue ([Watts and Zimmerman, 1990](#)).

[Healy \(1985\)](#) demonstrated that executives systematically, over the last five years, managed earnings by utilising the accrual approach to improve reporting earnings to maximise their expected bonuses. Therefore, the model built the discretionary accruals as the difference between non-discretionary and total accruals. The discretionary accruals are the accounts that provide managers with optional adjustments to the cash flows. On the other hand, non-discretionary accruals present the mandatory adjustments to cash flows required by the accounting bodies, which average is zero; therefore, the non-discretionary accruals value is zero. As a result, the values above or lower than zero are an indication of earnings

management. Therefore, some of the normal accruals are classified as discretionary accruals ([Dechow et al., 1995](#)).

[Healy \(1985\)](#) applied two models to deduct earnings management, as follows:

$$ACC_t = NA_t + DA_t \dots\dots\dots (1)$$

Where:

ACC_t are total accruals,

NA_t are non-discretionary accruals,

and DA_t is discretionary accruals.

$$NA_i = \frac{\sum_t TA_t}{T} \dots\dots\dots (2)$$

Where :

NA is non-discretionary accruals,

TA is total accruals scaled by lagged total assets,

t is 1, 2, ... years,

T is a year deducted for the existing year in the estimation period,

and i is a year deducted indicating a year in the event period.

2.6.1.2 DeAngelo (1986)

[Deangelo \(1986\)](#) examined managements' systematic decisions to understate the earned income for the purpose of enhancing their future payouts over public stockholders by buying public trade common shares companies to the non-public firms based on the valued price, which does not reflect the actual fair value price. Also, the study used accruals to measure the fair value of the non-arm's length acquisition. [Deangelo \(1986\)](#) analytical results found that there were no indications of using accrual to understate the earning before taking the public firm privately.

DeAngelo ([Deangelo](#)) built the model on three assumptions, namely: 1) regulator and business people adopt the idea of executives' capability of decreasing the earnings to manipulate the financial reports to understate the compensations; 2) security exchange commissioners state that the executives are to decrease the firm's stocks specifically before the payouts, and 3) information asymmetry and conflict of interest were utilised to decrease the earnings.

[Deangelo \(1986\)](#) reviewed executives' decisions in 64 traded companies in the New York and American Stock Exchange, where executives utilised the opportunities of inside information - information symmetry-and bought firms' stock after selecting accounting methods to understate the earnings. By doing so, the stocks did not reflect the actual common share values. Moreover, executives who held the majority control were able to block outsider bids.

The accounting accrual reflects the executive's decisions -NDA-, and the effect of accounting estimates changes in accounting methods -DA-, thus, executives were able to select various accounting techniques to reduce the earnings, such as upward biased expenses estimates, deferred revenue, accelerated expenses, write-offs, expenditures rather than capitalised and deferring the recognition of profit on investments till the acquisition is completed. As a result, the study indicated that there is no relationship between executives' decisions on accrual accounts and the payout. This outcome contrasts with [Healy \(1985\)](#) who considered that accrual methodology is not efficacious to deduct systematic income manipulations; accounting earnings realisation, which is an insignificant part of union negotiations, executives payout and payout may have generated conflict in the executives' interest.

[Deangelo \(1986\)](#) assumed that non-discretionary accruals in the last period are equal to non-discretionary accruals in the current period; therefore, any different values in accruals are an

indication of executives' manipulations. [Deangelo \(1986\)](#) calculated discretionary accruals the same as [Healy \(1985\)](#). According to [Dechow et al. \(1995\)](#), in both models ([Healy, 1985](#), [Deangelo, 1986](#)), the non-discretionary accruals measurement will be free of errors if the non-discretionary accruals are determined the same over time. Otherwise, both models will generate an error in measuring non-discretionary accruals.

[Deangelo \(1986\)](#) applied three models to deduct earnings management. The second model was used to measure the average value of abnormal accrual, and the third was to measure the non-discretionary accruals. The three models are as follows

$$ACC_t = NA_t + DA_t \dots\dots\dots (1)$$

Where,

ACC_t are total accruals,

NA_t are non-discretionary accruals,

and DA_t is discretionary accruals.

$$(ACC_1 - ACC_0) = (NA_1 - NA_0) + (DA_1 - DA_0) \dots\dots\dots (2)$$

Where:

(ACC₁ - ACC₀) = Average decrease in total accruals

(NA₁ - NA₀) = Average change in non-discretionary accruals

(DA₁ - DA₀) = Average decrease in discretionary accruals

$$NA_t = ACC_{t-1} \dots\dots\dots (3)$$

Where

ACC_{t-1} is total accrual for the last period,

and ACC_{t-1} is the measurement of non-discretionary accruals

2.6.1.3 The Jones (1991) Model

The study examined the executives' decisions adopted in injury firms, which showed a decrease in earnings during the import relief investigations. The standard Jones model

investigated foreign trade systems as the increase in import protection will directly benefit the importers, and, for that reason, executives have incentives to make efforts to increase such protections. The result of the study indicated that executives made income-decrease in discretionary accrual accounts during the import relief investigations based on the assumption that non-discretionary accruals are consistent.

The investigations have focused on three statutes in the foreign trade acts: 1) pertaining to the general escape clause; -2) countervailing duty and -3- antidumping investigations. The Traffic Act aims to protect domestic industries from goods sold at a lower price than fair value - antidumping- or from benefiting from foreign subsidies -countervailing- and the aid of domestic industries, which are damaged by increased imports -escape-.

In countervailing and antidumping, the Act demands that the firms present evidence of the existence of unfair trade. In escape, however, the United States International Trade Commission requires evidence of serious injury. Executives have more incentive to decrease the income to show a severe injury to grant the relief.

Understandably, increased earnings will enhance the executives' compensations and debt covenants. Executives would somewhat reduce the income in investigation periods as this will grant a future increase in earnings and, therefore, produce higher reimbursements. Also, not all domestic producers intend to manage earnings since the earnings override the import relief incentive ([Dechow and Sloan, 1991](#)).

Investigations of data on firms for previous years indicated healthy domestic productions and substantial profits. During the relief investigations, on the other hand, there was a decrease in reporting earnings. For that reason, the ITC challenged whether executives initially reduced the earnings. Processing the relief investigation, ITC has not verified audited statements, nor has it attempted to adjust the data. All reviewed data were from questionnaires, and the

verification focused on cost allocations to determine whether there was an injury ([Dechow and Sloan, 1991](#)).

The limitations of the [Dechow and Sloan \(1991\)](#) model

- The executives might be aware of ITC practices in reviewing the financial statements, as ITC does not adjust the discretionary accounting choices.
- Some of the firms that applied for the relief have a weak financial position, and executives do not intend to manipulate the financial statements unless to reach the threshold for the relief.
- Executives might have used cost allocation to shift the revenue and expenses, not the accruals.
- The study might not be adequate to detect earnings management.

The Jones model was different from [McNichols \(2000\)](#), as Jones generally focused on total accruals rather than a single account, while [McNichols \(2000\)](#) used single accruals. To justify the total accrual, the model indicated that the total accruals accounts would capture the full picture of managers' manipulations. Differently, as stated previously, [Healy \(1985\)](#), [Deangelo \(1986\)](#) separated total accruals into discretionary and non-discretionary in order to measure earnings management.

Jones model considered the non-discretionary accruals function of revenue, as any change in revenue will have a direct impact on working capital, for instance, account receivable, accounts payable and inventory. The more sales should generate a positive β_1 unless the sales were in cash and purchases were in credit, then β_1 should be negative. It documented that the decline in revenue will influence non-discretionary accruals ([Dechow and Sloan, 1991](#)). Also, β_2 should be negative as more considerable PP&E results in more substantial depreciation

([Barth et al., 2005](#)). Executives who decrease the earnings for relief would change the accounting methods to enhance earnings in the future in order to comply with debt to the covenant or to improve the compensations payout. Executives tend to reverse accrual accounts over a period of time - more than one year) in case there are reasons to apply again for relief shortly or to bypass expected ex-post settling up by the regulators.

Jones model suffers from omitted variables, as the model does not take into consideration other expenses that impact total accruals. [Yaari et al. \(2007\)](#) indicated that omitted variables would result in lower R and F statistics, which may result in an error since there will be a correlation between omitted variables and explanatory variables. The error may represent a biased correlation between independent variables and the error ([McNichols, 2000](#)).

In addition, in the Jones model, according to [Yaari et al. \(2007\)](#), some of the discretionary accruals in some of the firms which were deducted in the Jones model might not be due to earnings management, but due to economics and business conditions, for instance, acquisitions and sales of long-lived assets.

$$NDA_t = \alpha_1 \frac{1}{At - 1} + \alpha_2 \frac{\Delta REV}{At - 1} + \alpha_3 \frac{\Delta PPE}{At - 1}$$

Where: - ACCR_{it} is total accrual, measured by the difference of income before extraordinary item and cash flow from operating activities, - ΔREV it is changed in revenue, measured by the change in Sales it relative to Sales_{it-1}, - PPE it is the gross value of property, plant and equipment in year t.

2.6.1.4 Modified Jones

In her research, [Dechow et al. \(1995\)](#) examined several prior discretionary models ([Healy, 1985](#), [Deangelo, 1986](#), [Dechow and Sloan, 1991](#)) and the industry model. Many pieces of research were conducted in order to overcome the shortcoming of the Jones model. Some included omitted variables, and others applied different estimators. [Dechow et al. \(1995\)](#) stated that the Jones model operates under the assumption that discretionary accruals do not contain the changes in revenue, and, consequently, the effect of sales manipulation as revenue is considered as non-discretionary accruals.

[Dechow et al. \(1995\)](#) used a model identical to Jones', but modified the non-discretionary accruals, which are estimated during the earnings management period, as it considered the change in credit sales resulting from earnings management '*the change in revenues is adjusted for the change in receivables in the event period*' ([Dechow et al., 1995](#))

[Dechow et al. \(1995\)](#) acknowledged that there is a need to develop new models that examine earnings management in different techniques. In other words, the difference of this model and its contribution to the science of accounting is the fact that it considers the assumption that the changes in the number of sales on account may stem from earnings management applications ([Curuk and Yasar, 2014](#)). According to [Almasarwah \(2015\)](#), the modified Jones model is considered as the most powerful to deduct earnings, since the standard error results are lower than other models, and it is the first model to apply time-series data.

The modified Jones model considers that executives may manipulate accounting receivable in the event period. Nevertheless, in the estimation of the model, it ignores this assumption.

Following prior studies by [Hribar and Collins \(2002\)](#), [Matis et al. \(2010\)](#), [Goel \(2012\)](#), the cash flow approach was calculated as Net income – Cash flow from operating.

$$TACC_t = \Delta CAt - \Delta CASH_t - \Delta CL_t + \Delta DCL_t - DEP$$

Where, ΔC = Change in current assets in year t , $\Delta Cash$ = Change in cash and cash equivalents in year t , ΔCL = Change in current liabilities in year t , ΔDCL = Change in short-term debt included in current liabilities in year t , DEP = Depreciation and amortisation expense in year t .

$$NDA_t = \alpha_1 \frac{1}{A_{t-1}} + \alpha_2 \frac{\Delta REV - \Delta REC}{A_{t-1}} + \alpha_3 \frac{\Delta PPE}{A_{t-1}}$$

Where = Total accruals in year t divided by total assets in year $t-1$, ΔREV = Revenues in year t fewer revenues in year $t-1$, ΔREC = Delta revenues in year t less delta net receivables in year $t-1$, PPE = Gross property plant and equipment in year t , Total assets in year $t-1$,

Following prior studies by Collins and Hribar ([Hribar and Collins](#)), Sucala (2010) and Saher (2017), the cash flow approach was calculated as Net income – Cash flow from operating.

$$TAt = NIt - CFO_t$$

Where: TAt is total accruals in year t , NIt is Net Income in year t , and CFO_t is cash flows from operating activities in year t .

2.6.1.5 The Performance-Matching Model

In 2005, Kothari introduced the performance matching models to enhance the Jones and Modified Jones models, arguing that, in firms that are exposed to an unusual change in performance, their accruals are expected to be above zero. To solve the performance issue, [Kothari et al. \(2005\)](#) suggested to include current year ROA as an independent variable in the regression models. Kothari argued that modified Jones and standard Jones have a significant problem when applied to firms with high performance. When different applied models, Kothari stated that the results are unreliable, what is more it might drive incorrect result. The reason behind the incorrect result is the earnings, cash flow, economies associated with firms' past performance. Kothari analysis provides pieces of evidence that modified Jones and Jones

results without adjustment for performance, and industry means resulted in misspecification, which results in negative accruals. While utilising performance control provide positive discretionary accruals.

Accruals. While utilising performance control provide positive discretionary accruals.

$$NDA_t = \alpha_1 \frac{1}{A_{t-1}} + \alpha_2 \frac{\Delta REV - \Delta REC}{A_{t-1}} + \alpha_3 \frac{\Delta PPE}{A_{t-1}} + ROA$$

Where, research and development = Total accruals in year t divided by total assets in year $t-1$, ΔREV = Revenues in year t less revenues in year $t-1$, ΔREC = Delta revenues in year t less delta net receivables in year $t-1$, PPE = Gross property plant and equipment in year t , Total assets in year $t-1$, ROA = net income divided by return of assets

2.6.2 The Industry Model

This model was developed by [Jones \(1991\)](#) and assumes that the variations in finding non-discretionary accruals are common across firms of the same industry. Moreover, those non-discretionary accruals are not constant over time. The model has set three assumptions regarding accruals accounts, which are: (1- expenses manipulation: delay the recognition of expenses; (2- revenue manipulation: adding revenue and accounts receivable to total accruals and deducting the following year under the assumption of fixed costs; and (3- margin manipulation.

[Dechow et al. \(1995\)](#) illustrated two weaknesses in using the industry model: (1- it eliminates the change in non-discretionary accruals that are common across firms of the same industry considering firm-specific conditions; and (2- it eliminates the change in discretionary accruals that are correlated across firms of the same industry.

2.6.3 Specific Accrual Models

The specific accruals models concentrate on specific industries, for instance, financial institutions ([Scholes et al., 1990](#)), or insurance ([Gaver and Paterson, 2007](#)). These models emphasise that the practices of non-discretionary accruals are similar within the same industry ([Bartov et al., 2000](#)), and concentrate on single accruals or set of accruals that are subject to manipulations by executives ([McNichols, 2000](#)). [McNichols and Wilson \(1988\)](#) examined executives' manipulation of one single accrual account, the provision for bad debts. The study utilised 2,038 firms with receivables that consumed high values in assets and where the provision of bad debts was comparatively higher to their earnings. The study found through a developed model that firms' executives utilised provision for bad debts in order to decrease earnings. Other essential studies which examined specific industrial and a specific set of accruals include [Beatty et al. \(2002\)](#) who utilised both 1986 and 1989 year-end for 638 firms within 148 banks. The set of accruals the study investigated were: pension settlement gains and asset sales, loan charge-offs loan loss accounts, investment security insurance, pension settlement gains and asset sales. The result of the study indicated that executives manipulated the financial reports to regulate the capital level through a decision to issue securities and loan charge-offs. These three sets of accrual accounts were manipulated separately based on the levels of the other two and the level of gains and losses. Also, gains and losses account and pension settlement gains were independently manipulated with no consideration for the other five sets of accruals. Another study by [Chen et al. \(2012\)](#) investigated the bank industry for a specific set of accruals accounts, precisely, loan loss provisions and loan sales and securitisations. The study examined data for 382 banks for the years from 2001 to 2007. The finding indicated that executives utilised loan loss provisions to reach earnings benchmarks before structuring loan sales and securitisations.

[McNichols \(2000\)](#) compared the trade-off related to earnings managements based on aggregate accruals, specific accruals and distribution. The study compared and documented the advantage and of a specific accrual approach over aggregate approach as, based on the researchers' knowledge and depth of accounting principle, they were able to provide critical factors that affected the accruals. The specific accruals can be utilised where industry firms' accruals are subject to professional judgement; there is a higher probability to determine the relationship between a specific accrual and independent variable than all accruals accounts in aggregate accruals. Nevertheless, the study also included the disadvantage of a specific accrual approach over aggregate approach since, given executives' ability to utilise all accruals accounts, the test for a specific account could reduce the power of the test as executives could utilise different sets of accruals that have not been examined. As a result, the research requires considerable resources, time and funds to examine each accrual account individually. Second, to examine a specific accrual, the researcher requires to have advanced knowledge of a specific accrual and a more significant set of data. Lastly, the firms examined under specific accruals are generally fewer than aggregate accruals, which reduces the ability to generalise the finding. Generally, the one stage and two stages are two approaches adopted when implementing specific accruals in order to identify earnings management and choices of the stage are based on the study's objective ([Salem, 2018](#)). [McNichols \(2000\)](#)

TABLE 2.1. Evolution of specific accrual models

Year	Author	Discretionary accrual proxy
1988	McNichols and Wilson	Residual provision for bad debt, estimated as the residual from a regression of the provision for bad debts on the allowance beginning balance, and current and future write-off.
1992	Petroni	Claim loss reserve estimation error, measured as the five-year development of loss reserves of property casualty insurers.
1996	Beaver and Engel	Residual allowance for loan losses estimated as the residual from a regression of the allowance for loan losses on net charge, loan outstanding, nonperforming assets and one-year-ahead change in nonperforming assets.
1997	Beneish	Days in receivables index, gross margin index, asset quality index, depreciation index, selling general and administrative expense index, total accruals to total assets index.
1998	Beaver and McNichols	Serial correlation of one-year development of loss reserves of property-casualty insurers.

2.6.4 Distribution of Earnings Models

The distribution of earnings model approach is focused on recognising behaviours that influence earnings. This model refers back to ([Hayn, 1995](#), [Burgstahler, 1997](#), [Degeorge et al.](#),

[1999](#)). Under the distribution of the earnings model approach, meagre earnings level of firms is scaled by size, mostly total assets, and grouped based on the level of net income. All distributional irregularity is documented as proof of manipulations.

[Hayn \(1995\)](#) examined 9,752 firms for the period from 1962 to 1990 to identify the impact of loss on earnings. He documented that EPS value is related to current earnings and, for firms who avoid reported losses, their net income is above or around zero. [Burgstahler \(1997\)](#) utilised three models to assess earnings management. The study specified that the distribution of earnings and variation of earnings would be symmetrical. They documented that 8%-12% of firms managed earnings in order to increase earnings, 30%-4% of firms managed earnings to avoid losses and achieved positive income. Another study by [Holland and Ramsay \(2003\)](#) applied the distribution of reported earnings method utilising Australian data. Their study was not consistent with ([Burgstahler](#)) as the threshold result included firms that reported small losses or decreased earnings and were unable to explain the results. Another study by [Beaver et al. \(2003\)](#) examined the relationship between the distribution of reported earnings and loss reserve development. Their finding was consistent with Burgstahler and documented that small positive earnings firms occurred more than expected, and these firms had understated the loss reserve accruals.

([McNichols](#)) documented that the main advantage of the earnings distribution method is that it provides researchers with the anticipated frequency of earnings. Taken into consideration the difficulty of accruals approaches, aggregate accrual and specific approach offer prediction on the behaviour of accruals when there are no manipulations. [Healy and Wahlen \(1999\)](#) also indicated the advantage of earnings distribution method over accruals approaches because earnings distribution method contains a real activities approach, which cannot be captured by accrual, for instance, reduction of advertising expenditures. On the other hand, the earnings distribution approach was criticised by many researchers, for instance, [Kerstein and Rai \(2007\)](#)

argued that the shape of earnings distribution does not provide enough evidence when there are no manipulations or on the directions of manipulation when it exists.

As a result, many researchers have applied and examined earnings increasing through the earnings distribution approach to meet the benchmarks, yet the model provides no sufficient evidence and explanations on downward earnings management.

2.6.4.1 Peasnell, Pope and Young (2000)

([Peasnell et al.](#))

Another essential research by [Peasnell et al. \(2000\)](#) aimed to evaluate three models - the standard and modified Jones models and the marginal model - in order to estimate the managed component of working capital accruals. It indicates that the cross-sectional model is appropriate when applied to the random sample. On the other hand, the marginal model provides better results in finding the abnormal accrual estimates when cash flow performance is extreme. In addition, all models are capable of presenting high power tests for earnings management upwards. In respect to the bad debt and revenue manipulation, the standard Jones and modified Jones are more efficient in deducting the earnings management. Finally, the marginal model was found to be more potent in deducting expenses manipulation.

To assess the effectiveness of each model, in deducting the accrual management, the study examined the following: (1- revenue manipulation; (2- expenses manipulation (excluding the bad debt-; and (3- bad debt manipulation.

In conclusion, empirical results indicated that the standard Jones and modified Jones are better tools in detecting revenue and bad debt manipulation, and the marginal model is more efficient in deducting expenses manipulation. Furthermore, this study contributes to prior studies; using cross-sectional analysis, it estimated managed accrual by developing new procedures, and the outcome provides guidance on deducting earnings management activities. In addition, the

study indicated that, when cash flow performance was extreme, the marginal model was more powerful, especially in deducting accruals linked to bad debt. [McNichols \(2000\)](#) provided the progress of distribution models, as shown in the table (2-2).

TABLE 2.2. Evolution of distribution models.

Year	Authors	Test for earnings management
1997	Burgstahler and Dichev	Test whether the frequency of annual earnings realisations in the region above (below) zero earnings and last year's earnings is higher (less) than expected.
1999	Degeorge et al.	Test whether the frequency of quarterly earnings realisations in the region above (below) zero earnings, last quarter's earnings and analysts' forecasts is greater (less) than expected.
1999	Myers and Skinner	Test whether the number of consecutive earnings increases is more significant than expected absent earnings management.

2.6.5 Discretionary Revenues Models

Prior have provided different models to deduct earnings management by utilising discretionary revenue. [Stubben \(2010\)](#) indicated that discretionary revenue is more likely to provide better results than accruals models in deducting revenue and expenses manipulations. The model defined discretionary revenue as the difference between annual revenues and the actual change in receivables. The model is comparable to accruals models such as [Dechow et al. \(1995\)](#); however, there are three key differences. First: it utilises the receivables accruals instead of

aggregate accruals, as receivables have more impact on revenues. Second: it utilises receivable accruals instead of the change in cash revenues to present the change in reported revenue. Third: the model recognises the change in revenue in the first three quarters and the change in the last quarter revenues since the end of the year mostly collects the revenues.

The study argued that the model is better than the accruals models, as follows.

- I. The revenue model not only deducts the revenue management but also, earnings management through revenues, whereas accruals models do not.
- II. The model is better than accruals models in deducting the earnings management for revenue and expense manipulations equally, whereas accruals models do not.
- III. The model is better in deducting earnings management when it occurs rather than accrual models, which falsely indicates earnings management. ([Caylor, 2010](#))

Another critical model under discretionary revenues models is ([Caylor](#)), which focuses on the analysis of the accrued revenue (account receivable- and deferred revenue (advance on cash-. The outcome of the model indicates that the management utilised both accounts (deferred revenue and account receivable- to avoid negative earnings surprises. The Oxley Act of 2002 has mitigated the management's desire to use the deferred revenue over account receivable by firms. Also, [Caylor \(2010\)](#) classified the account receivable (accrual- managed through real business activities as follows: credits policies and managing the account receivable is more costly and has future cash consequences where the unearned revenue (deferred- cash has been received and does not count as accounts receivable. Accordingly, it was mostly interested in the discretion in revenue recognition. Furthermore, [Caylor \(2010\)](#) extended his study to cover more models, such as:

- The average change in short-term deferred revenue to determine the abnormal change in short-term revenue and normal change in short-term gross accounts receivable to determine the abnormal change in gross accounts receivable.

In this model, [Caylor \(2010\)](#) removed the discretionary component linked to the account in question to estimate the pre-managed earnings. At that point, he tested the abnormal change to determine whether it was more significant than the pre-managed earnings, and then examined both accounts – revenue and accounts receivable - to determine whether the managers preferred one account to the other.

The model has contributed to the earnings management studies by presenting new descriptive evidence on deferred revenue as it also considered the first research that examined firms' revenue, deferred and accruals, to enhance the earnings. In addition, it uses a 'comprehensive analysis of revenue manipulation concerning all three earnings benchmarks' ([Almasarwah, 2015](#)). In [Caylor \(2010\)](#) model, the normal charge is the gross accounts receivable model and the normal change in the deferred revenue model:

$$\Delta \frac{Gross\ Rev_t}{A_{t-1}} = \alpha_0 + \alpha_1 * (1/A_{t-1}) + \beta_1 * \left(\frac{\Delta S_t}{A_{t-1}}\right) + \beta_2 * \left(\frac{\Delta CFO_{t+1}}{A_{t-1}}\right) + \varepsilon_t \dots \dots (1)$$

Where;

$\Delta Def Rev_t$ is the change in short-term deferred revenue during year t,

A_{t-1} is the beginning of the year total assets,

$\Delta St+1$ is the change in sales during year t + 1,

$$\Delta Def \frac{Rev_t}{A_{t-1}} = \alpha_0 + \alpha_1 * \left(\frac{1}{A_{t-1}}\right) + \beta_1 * \left(\frac{\Delta S_{t+1}}{A_{t-1}}\right) + \beta_2 * \left(\frac{\Delta CFO_t}{A_{t-1}}\right) + \varepsilon_t \dots \dots (2)$$

Where;

$\Delta Def Rev_t$ is the change in short-term deferred revenue during year

t , A_{t-1} is the beginning of the year total assets,

$\Delta St+1$ is the change in sales during year $t + 1$,

and ΔCFO_t is the change in cash flow from operations.

2.7 Balance sheet approach vs cash flow approach

As mentioned previously, total accruals have been calculated utilising different approaches, the main ones being the balance sheet and cash flow. Balance sheet approach is built on the assumption of the changes in the current accruals. Specifically, the decrease and increase in current assets, current liabilities, cash and cash equivalent, current maturities of long term debt and other short term debt and the depreciation and amortisation expenses. The main issue in the balance sheet approach is that the non-operating event (merged firms and acquisitions-incurred during the period have a direct effect on the current assets and current liabilities with no earnings impact. Net current assets tend to increase as a result of acquisitions.

Similarly, accounts receivable and inventory will increase as a result of merged firms. [Hribar and Collins \(2002\)](#) examined the calculation of accruals using the balance sheet approach and pointed out that prior research that examined accruals using the balance sheet approach should re-evaluate their results because of accruals calculations errors. Also, the study documented that, as a result of errors in accruals, researchers may not find statistically significant results. [Zang \(2011\)](#) also investigated both approaches and eliminated all firms that were affected by mergers and acquisitions. The study indicated that the total accruals under the balance sheet are higher than the total accruals under cash flow due to certain factors. This return differential seems to be caused by non-articulations in changes in accounts receivable and other funds from operations. Also, there are items included in cash flow, but not in the balance sheet approach, such as deferred income taxes, equity in net earnings and losses, gain and losses from sales of PPE and investments, and other funds from operations, all of which impact the

result of total accruals. As a result, the researcher concluded that each of the approaches could lead to different results and would generate different conclusions, which may impact the quality of the research if only one approach were taken. Therefore, the researcher will utilise both approaches in order to determine which is more suitable.

2.8 Real Activities Approach

In recent years there has been an increased interest in exploring different manipulations method. Recently, earnings management research has focused its attention and moved from accruals model to real activities. The main point of the existence of real activities manipulation studies is that researchers acknowledge that GAAP accounting standards are unlikely to cover all the possible situations and business practices. Therefore, the abuse of using accruals level has resulted in the regulator having to limit the degree of flexibility to firms and emphasise on more reliable audit performance. These rules and restrictions have pushed executives to find alternative ways to achieve their incentives and manage the outcome. [Graham et al. \(2005\)](#) provided strong evidence in their research which indicated that executives prefer real activities manipulation to accruals. Similar to accruals techniques, executives employ real activities techniques in order to manage earnings. [Schipper \(1989\)](#) introduced the concept of real earnings. Specifically, he introduced the cash flow activities in order to manipulate the earnings. In addition, correspondingly, [Xu et al. \(2007\)](#) categorised the executives' actions into operating, investment and financing.

2.8.1 Operating Activities

Operating activities are such as sales, general admin and sales expenditure, and productions. [Roychowdhury \(2006\)](#) indicated that executives might utilise different techniques in order to manipulate the operating activities, such as to aggressively accelerate sales by either providing more discounts and/or lenient credit terms. [Jackson and Wilcox \(2000\)](#) stated that executives upward the earnings to meet their target by providing late sales discount at the end of the year.

Beside sales manipulation, the impact of managed sales impacts the account receivable, which included the allowance of doubtful account. In addition, executives may change the cost of products that have been sold by changes in production and allocating more fixed overhead costs over the production units. [Thomas and Zhang \(2002\)](#) comprehensively discussed executives' overproductions in order to reduce the overhead. The study indicated that the increase or decrease in inventory productions directly linked to the level of demands and earnings management. The change in productions level impacts the inventory level as well, which might cause an increase in holding cost. Different techniques that may be utilised by executives include discretionary expenses. Executives may delay or spend more based on their incentives, such as the timing of training, the amount of marketing and the time and amount of administration expenses since these items in the financial statements are not recognised as assets. [Gunny \(2010\)](#) provided evidence that executives reduce discretionary expenses, such as a reduction in research and development expenditure, reduction in selling admin and general, in order to achieve higher earnings.

2.8.2 Financial Activities

[Marquardt and Wiedman \(2005\)](#) documented the financial activities, specifically, firms' convertible bonds structure, in order to dilute earnings per share. In the same manner, [Dechow et al. \(2010\)](#) examined earnings manipulation and gains from assets securitisations and indicated that executives manage the time of the securitisations transaction, specifically at the last week of the quarter, in order to report the gain and avoid loses. [Farrell et al. \(2014\)](#) stated that executives repurchase shares by examining 94,382 firm-year observations for the period from 1983-201. Firms with high financial constraints are negatively related to repurchase and positively related to accruals. [Hribar et al. \(2006\)](#) examined firms that repurchase stock in order to meet or beat the analysts' earnings per share. The study indicated that a large number of firms would not have met the analysts' figures without repurchasing the stocks.

2.8.3 Investing Activities

In investing activities, research and development dominated prior kinds of literature. [Baber et al. \(1991\)](#), [Roychowdhury \(2006\)](#), [Gunny \(2010\)](#)) indicated that cutting the spending on research and development has a direct impact on cash flow for the current period. Therefore, it has a direct impact on executives' decisions. [Garanina and Nikolaeva \(2016\)](#) found that executives reduced research and development investments in order to avoid losses. [Cheng \(2004\)](#) indicated that executives' compensations are linked directly to a decrease in investing in research and development activities. In addition to research and development, executives utilise the timing of selling the assets. [Gunny \(2010\)](#) pointed out that executives choose the periods of sales in order to report either losses or gain. [Black et al. \(1998\)](#) showed that executives sold the assets in a particular time and situations in order to smooth earnings and avoid violation of debt covenants and report a higher debt to equity ratio. Similarly, [Wang et al. \(2010\)](#) examined Taiwanese firms to assess whether executives utilise the timing of selling the assets. The results indicated that firms with earnings above zero sold assets prior to reporting periods.

2.8.4 Roychowdhury (2006)

The [Roychowdhury \(2006\)](#)

The most recent and advanced theory proposed by [Roychowdhury \(2006\)](#), [Cohen et al. \(2008\)](#), [Zang \(2011\)](#) offer a new approach of manipulations, and they indicated that real activities manipulation occurs in three methods.

- Sales method: enhancing sales by providing increased sales discounts and providing lenient credit terms.
- Production method: by producing more goods than required to increase earnings.
- Discretionary expenditure method: executives manipulate through reducing the general admin and selling expenses, and/or reducing research and development expenses.

[Roychowdhury \(2006\)](#)

examined 4252 firms in the United States for the period between 1987 and 2001 and aimed to identify real activities in the firms that manage earnings around zero. The outcome of the study indicates that sales manipulation, overproduction and reduction of expenditure were employed in order to avoid losses. Also, the study provided strong evidence on the impact of industry and firm growth. Acknowledged the cost associated with real activities approach; however, he argued that even the consequences of real activities manipulations on the firms, such as reducing the firms' economic values, executives are more to apply the real activities method because they can not utilise accruals manipulations solely. [Bens et al. \(2003\)](#) find durable pieces of evidence that executives reduced research and development expenditure to direct the fund to repurchases stock to avoid EPS dilution. [Roychowdhury \(2006\)](#) provided an explanation of the reasons for using production instead of the cost of goods sold. Since the cost of goods can be managed by using inventory manipulations. For example, they were delaying the obsolete write-off. Also, the method that used to value inventories, FIFO and LIFO, impact the cost of goods sold. These kinds of activities will have no impact on productions as the delay of writing will not affect production, and the value method will be offset by inventory change. However, [Roychowdhury \(2006\)](#) argued that overproduction is mainly used by manufacturing. Therefore, overproduction is manipulations.

2.8.5 Gunny (2010)

Another critical study in the real activities stream is by [Gunny \(2010\)](#), which study examined 4,028 firms in the period between 1998 and 2002. The study examined both accruals managed and real activities to find the influence on future performance. The study included additional measurements in the [Roychowdhury \(2006\)](#) models; namely, selling, general and, administrative expenses, and timing of fixed asset sales to report gain. It also included market value variables, which were calculated as the number of common shares outstanding multiplied by the share price. However, even though the model included additional variables, it suffered from endogeneity. *“the simultaneity between the dependent and explanatory variables.”* ([El Diri, 2018](#)).

Following [Roychowdhury \(2006\)](#) [Arifin and Kusuma \(2011\)](#), the researcher utilised three methods as proxies to measure real activities, abnormal cash from operations (Model One-, abnormal production costs (Model Two- and, abnormal discretionary expenses (Model Three-. Following prior research, all three models are combined to represent RM; however, since the researcher examined innovation, the abnormal discretionary expenses (Model Three-were adjusted to remove research and development.

The abnormal level of cash flow resulting from residuals is estimated from the following

$$\frac{CFO_{it}}{ASSETS_{i,t-1}} = \beta_1 \frac{1}{ASSETS_{i,t-1}} + \beta_2 \frac{SALES_{it}}{ASSETS_{i,t-1}} + \beta_3 \frac{\Delta sales_{it}}{ASSETS_{i,t-1}} + \epsilon_{it}$$

The abnormal level of productions is derived from residuals, estimated from the following

$$\frac{PROD_{it}}{ASSETS_{i,t-1}} = \beta_1 \frac{1}{ASSETS_{i,t-1}} + \beta_2 \frac{SALES_{it}}{ASSETS_{i,t-1}} + \beta_3 \frac{\Delta sales_{it}}{ASSETS_{i,t-1}} + \beta_4 \frac{\Delta sales_{it}}{ASSETS_{i,t-1}} + \epsilon_{it}$$

The abnormal level of discretionary expenses is derived from residuals estimated from the following

$$\frac{DISX_{it}}{ASSETS_{i,t-1}} = \beta_1 \frac{1}{ASSETS_{i,t-1}} + \beta_2 \frac{\Delta sales_{it}}{ASSETS_{i,t-1}} + \epsilon_{it}$$

However, since this PhD is examining innovation by utilising research and development, the researcher adjusted the abnormal level of discretionary expenses as following:

$$\frac{DISX_{it} - r\&d}{ASSETS_{i,t-1}} = \beta_1 \frac{1}{ASSETS_{i,t-1}} + \beta_2 \frac{\Delta sales_{it}}{ASSETS_{i,t-1}} + \epsilon_{it}$$

2.9 The Difference between Real and Accrual Earnings Management

One can argue that real activities manipulation is a better choice for executives than accruals manipulation for many reasons, such as the risk from the Securities and Exchange Commission when executives are exercising aggressive accounting selection. According to [Cohen et al. \(2008\)](#), executives referenced changes from accruals to real activities after the Sarbanes Oxley Act 2002. [Graham et al. \(2005\)](#) provided strong evidence on executives' choices of real activities in order to avoid regulators. In addition, real activities are more fixable than accruals.; executives may be limited in accruals ([Roychowdhury, 2006](#)). [Cohen and Zarowin \(2010\)](#) argued that firms audited by highly efficient auditors such as the big five are more likely to utilise real activities over accruals. ([Roychowdhury, 2006](#)). [Cohen and Zarowin \(2010\)](#) argued that firms audited by highly efficient auditors such as the big five are more likely to utilise real activities over accruals. [Sohn \(2016\)](#) stated that, when accruals manipulation decreases real activities, manipulation increases, whereas [Zang \(2012\)](#) argued

that there is no tradeoff and executives used both at the same time. This PhD argues that the real activities manipulations are as risky as accruals manipulations. While executives manage earnings using real activities, they might be able to increase current earnings, but they might also risk future earnings and current cash flow. In real activities manipulations, executives reduce cash flow by overproducing and great sales discount. The shortage of cash flow may come through the cost of innovations and other projects. In addition, there are costs associated with overproduction that executives may not consider, such as holding inventories costs, impairment and obsolesce and less future profit caused by less marketing expenditure. Another reason which can increase the risk of real activities manipulation is a deviation from firm strategies; for instance, [Bens et al. \(2003\)](#) indicated that executives' reduction of innovation expenditure to shock repurchase results has a negative effect on the firm's future performance. [Gunny \(2010\)](#) also indicated that real activities manipulation has a negative impact on a firm's future performance.

2.10 Example of earnings management in economies

2.10.1 Developed Economies

Earnings management is a critical element that is necessary for fostering innovation within business firms. Innovation is sometimes a resource-intensive undertaking which requires active management and budgetary allocations. This also entails the element of risk management, especially for novel-product forms of innovation ([Bajra and Cadez, 2018](#)). The US, as an example, uses the Generally Accepted Accounting Principles for financial accounting and reporting purposes. This has an impact on the earning portfolios and eventually on the scope of earnings and the extent of innovations. Actual firm cash flows are the significant determinants of short-term and long-term access to resources required to drive innovation ([Evans et al., 2014](#)). From an accounting point of view, the US system uses the rule-based approach to financial accounting and reporting as opposed to the principle-based

approach, which is used by countries that prefer the International Financial Reporting Standards. Reporting standards determine the level of allowable discretion that firms can exercise with their earnings and how they can utilise available resources for business continuity and innovation ([Sun and Anwar, 2018](#)). The regulatory environment has a direct impact on how firms practice earnings management and the extent to which they can use resources for specific innovation strategies. Convergence requirements for firms with an international orientation also impact on how earnings are reinvested in innovative ideas([Evans et al., 2014](#)). Manipulation of accruals and management of underlying business activities also determine how the management of earnings is carried out in the country. Management of accrued earnings has been widely used in the country to help finance innovation strategies. Under the US accounting and reporting standards, firms are allowed to manipulate provisions and requirements of GAAP ([Bajra and Cadez, 2018](#)). There has been extensive debate over which approach is better, US GAAP or IFRS, in the scope of limitation of earnings management. The chairman of the financial accounting standard board criticised, giving more professional judgment to executives given the cases from US firms; he also indicated that auditors and executives in US firms could not be fully trusted. In the same direction, [Selling \(2007\)](#) indicated that IFRS rules are a gift to US' executives.

In order to maximise earnings, the period within which they have reported impacts remittances to tax authorities and allowable amounts. The most successful and profitable companies in the US today have robust innovation strategies which are driven by strong earnings management strategies as well ([Sun et al., 2011](#)). This is contrary to a majority of firms that rely on random innovations and lack of earnings management practices to facilitate this. Innovations have timelines which require funding at different phases or junctures. In this regard, firms are compelled to have financing mechanisms for activities such as research and development ([Evans et al., 2014](#)). Based on the nature and value of transactions, accrual earnings

management in the US allows the timing of when actual business transactions occur to be altered. This can be done in order to have enough capital or resources at a specific juncture to finance specific aspects of innovation or business continuity. The accrual-based approach is common within US firms and allows them to have optimal resources for innovative strategies. This is evident among the top companies such as Google, Apple, and Microsoft, which are compelled to employ stringent earnings management practices in order to facilitate progressive innovation, research, and development. However, even though accrual earnings are used as an earnings management strategy in the US, firms have to be careful to avoid conflicting reports with trading partners or clients. This means that firms have to enter into agreements with trading partners for the system to work effectively ([Han et al., 2010](#)). Based on this requirement, the GAAP rule-based approach to financial accounting reporting does not provide an appropriate environment for many firms to use this strategy, especially in the small and medium tiers. However, large firms have higher leverage and negotiating power with trading partners and can, hence, institute clauses to facilitate accrual-based earnings management for their own benefit. In this regard, firms in the US that have huge financial muscle have the ability to influence accounting standards applied by their partners to a specific extent. On the other hand, rule-based accounting standards are not favourable for small- and medium-sized firms ([Bonacchi et al., 2019](#)). Such firms are compelled to either use principle-based accounting standards for earnings management or use the rule-based approach to a moderate extent.

While the accrual earnings system of earnings management is moderately practised in the US, GAAP is designed to reduce the opportunities for firms to use this approach. In this regard, most firms in the US are compelled to employ the real earnings activities approach to finance their activities ([Bajra and Cadez, 2018](#)). For instance, the main earnings management approaches used include manipulation of sales, reduction of discretionary expenditures and

manipulation of production volumes. These techniques rely on market structures and trends in order to archive intended financial goals. The techniques require advanced financial management and expertise in order to yield success ([Zang, 2011](#)). Firms using this strategy in the US are compelled to carry out market studies in order to determine the optimal timing and efficacy of a chosen strategy. For instance, sales manipulation has been used widely to counter competition and boost earnings targets. This is a common trend for retail firms which engage in constant price wars with rivals. For instance, large retailers like Wal-Mart and Amazon have periodic cuts in prices which are aimed at attracting more consumers and making more sales ([Enomoto et al., 2015](#)). This strategy relies on huge sales volumes with lower profit margins which translate into huge overall profits in the long run. Sales manipulation is also conducted using approaches such as limited offers and discounts, accommodative credit terms or lowered interest rates ([Han et al., 2010](#)). This approach entails providing market incentives through pricing to increase earnings for a short period of time. Since the US is one of the largest international markets for products and commodities, overproduction is also sometimes used as an approach in real earnings management. Overproduction is normally associated with lower costs due to economies of scale, hence reducing the price of commodities and raising expected earnings. This approach is also used when there is an expected increase in demand. For instance, during the festive season, firms use the opportunity to overproduce and achieve a greater number of sales due to the expected increase in demand ([Enomoto et al., 2015](#)). In order for this strategy to work effectively, it requires mastery of consumer trends in specific industries. This strategy can also be used in order to reach financial goals required to attract external investors. Real earnings management is also practised through the reduction of discretionary expenditure and by diverting the resources to activities such as innovation, research, and development. For instance, a firm may choose to abandon a project in favour of another deemed to be more lucrative. This approach requires strategic management as it may

involve high degrees of risk in terms of overall earnings. When firms intend to internally finance projects in their innovation strategies, they are sometimes compelled to look for legal ways to have higher earnings when compared to expenditure. This means that firms are compelled to halt some activities, such as hiring, or increase working hours for employees in order to reach their financial goals. Reduction of discretionary earnings as a way of managing real earnings requires effective organisational management practices in order to meet current organisational requirements while, at the same time, fostering future growth and sustainability. Firms must also consider future cash flows which may be affected by the manipulation of current cash flows. Due to the constraints of GAAP in accrual earnings management, firms in the US have been forced to look for creative ways of increasing their earnings in order to finance innovative ideas and the running of daily activities. Unlike accrual earnings management, real earnings management requires high levels of professional judgement and prudence as it ought to be conducted within the stringent confines of financial principles and the law. Real earnings management in the US has created significant potential in terms of earnings management as creative ways of increasing earnings for firms in the country have progressively emerged. In addition to this, real earnings management has a lower likelihood of resulting in accounting scandals and fraud as opposed to accrual earnings management. The tight nature of GAAP standards has increased the scope of real earnings in the country, which have consequently been used to finance some of the most innovative ventures in the country and the world at large. Another reason why real earnings management is more common in the US is that it offers a range of approaches from which firms can choose. A firm can combine multiple approaches or move forward at different times based on financial requirements and risk appetite. This is evident in different industries as certain real earnings management strategies are more common in some firms than others ([Zang, 2011](#)). Thus, the potential for innovation is less than optimal in the US, as a result of restrictive rule-based accounting

principles and an expensive alternative to the manipulation of real activities in the area of earnings management.

Canada is another example of developed economies, the lack of aggressive innovation strategies among Canadian firms means that innovation is not central to earnings management strategies employed by firms. Again, accounting standards in the country play a key role in determining the nature of the earnings management system that most companies use ([Othman and Zeghal, 2006](#)). The principles used have a primary role in safeguarding shareholder interests even as firms look to achieve long-term growth and sustainability. Canada can be said to have an Anglo-American accounting model which determines how firms report their earnings and the extent to which they can exploit respective principles regulations. The accounting system in Canada is designed to meet the needs of the providers of capital which relates to the return on their investments. In this regard, companies may fail in other respects, such as the areas of research and development and innovation, as shareholder wealth is given a priority ([Guido et al., 2010](#)). The accounting system does not include enforcement values and firms rely on the provisions of the law and professions. The pattern of financing also determines how firms practise earnings management. Banking and market-oriented financial systems determine the earnings management behaviour within the Canadian economy. The capital market is a major financial factor among Canadian firms; it is mainly dominated by equity and shareholders. In this regard, these providers of capital require accountability from managers and are compelled to carry out earnings management in a manner that satisfies these parties. Managers in Canadian firms are compelled to use their professional discretion in order to withstand this pressure. It may, therefore, become difficult for policymakers within Canadian firms to convince providers of capital and shareholders of the need to spend significantly on such activities as research and development and potentially risky innovation

practices. This is also seen in corporate governance practices which also influence earnings management in the country.

The Canadian model is a stockholder one whereby a board of directors is elected and tasked with an oversight role. Financial analysis and financial processes also help in the evaluation of accountability and reporting practices. The use of managerial discretion is, therefore, significant in terms of managing such control constraints, which means the scope of earnings management is significantly strict. As a country adopting an Anglo-American system, Canadian firms have a high level of flexibility and transparency ([Othman and Zeghal, 2006](#)). This means that they are more likely to engage in real activities-based methods of earnings management as opposed to accrual methods. There is a high level of separation between owners and managers in Canadian firms. In this regard, the level of owner involvement in the day-to-day running of firms is lower when compared to other countries, such as in the Euro-Continental regions. Earnings management that takes into consideration the needs of shareholders and lower priorities for other stakeholders is likely to have a skewed impact on aspects such as innovation ([Gosalia, 2010](#)). This is especially true in instances where the risk appetite is low, as it is for Canadian firms. As a result, firms would rather retain earnings as opposed to investing in innovative ventures. As long as firms make adequate profits to remain relevant in the local markets, earnings management strategies are simple in nature and geared towards this ([Lee and Swenson, 2011a](#)). The low level of presence of Canadian firms in the global market means that most companies are oriented towards the local market. This means that the scope of earnings management is also limited and remains within the domestic scope of the firms. With multiple firms based companies in the country, earnings management for these firms is determined by the strategies employed by the parent company and allowable practices in the country's laws and regulations.

Firms that engage in earnings management in Canada, as an Anglo-American country, use accounting standards that are based on common law. These accounting standards have become widely accepted and adopted, and have been adopted by a majority of firms in the country ([Lee and Swenson, 2011a](#)). Earnings management in Canada is flexible as financial reporting is not impacted by taxation requirements. In other jurisdictions, the taxation framework is pegged onto the accounting framework where similar documents are used ([Othman and Zeghal, 2006](#)). However, in Canada, financial reports do not determine tax liability. Most firms, therefore, use this to control tax liability as a way of earnings management. For instance, expenses incurred by a firm do not have to be included for tax allowance purposes. Even though financial reports are closely related to the computation of tax liabilities, firms in Canada have the ability to organise their activities in a manner that maximises profitability and reduces the tax implications. There are specific laws and regulations used to calculate taxable income which is not dependent on company law ([Liu and Sun, 2015](#)). As in the US, the use of accrual-based techniques for earnings management purposes is less common than activity-based earnings management. This is driven by the culture of transparency and disclosure that is highly advocated for in the country. Firms that have potentially large tax benefits in the country are especially likely to control their expenditure as one of the techniques for real earnings management. Other techniques for earnings management, such as overproduction, are only used to a minimal extent due to market challenges and competition. Most Canadian firms also only serve the domestic market, hence making the scope of real earnings management small as well. Canadian firms have similar characteristics to US firms, but, at the same time, have some unique factors in relation to earnings management and how they operate. Equity markets in the country are well-developed according to international standards and the economic level of the country. For Canadian firms, ownership is highly concentrated when compared to other countries like the

UK or US, where ownership of firms is highly dispersed. There is a large number of Canadian firms whose ownership is controlled by a large block holder or in other instances, groups of investors. In this regard, Canadian firms face a challenge with dominant shareholders who may seek to influence the extent and nature of earnings management at the expense of minority shareholders ([Othman and Zeghal, 2006](#)). This has been a problem for Canadian firms in the past, but laws have now been enacted to safeguard the interests of minority owners as well. Strong protection of minority shareholders has a direct impact on the level of accrual-based earnings management that a firm can engage in. Strong regulatory frameworks, however, prevent aggressive accrual-based management, which is likely to result in fraudulent activities at the expense of minorities ([Park and Shin, 2004](#)). Most local companies in Canada carry out earnings management practices based on the needs of the domestic market. With a well-developed stock market, firms raise funds platforms such as initial public offerings which are more oriented towards real activities earnings management ([Burnett et al., 2015](#)). With the Canadian system advocating for high levels of accountability to shareholders, executives are compelled to use their professional discretion to determine the earnings management practices that meet this requirement. Executives, therefore, have to ensure that their interests meet shareholders' interest. Studies on Canadian firms have shown that firms that have a higher risk appetite in the Canadian context are likely to issue large offerings in the capital markets when compared to conservative firms, which opt for smaller offerings. The difference between the two types of firms is that larger firms also show aggressive earnings management practices when compared to their smaller counterparts. In this regard, the levels of earnings management in Canada are higher among publicly owned companies when compared to private companies.

2.10.2 Earnings Management in Developing Economies

In the same way that the innovation strategy in the UAE is unique, as an example of developing economies, so is earnings management. Conventionally, the country had a

significantly low penetration in the private sector with the government taking control of most elements of the economy. It is only recently in its diversification and economic growth efforts that it has encouraged the growth and development of the private sector. With flexible earnings management frameworks, the country has been able to achieve significant economic milestones through infrastructural business and economic transformation. The country, historically, had a unique accounting system that is mainly governed by Islamic laws that are prevalent in the region. In its internationalisation bid, the UAE welcomed International Financial Reporting Standards, which are bound to impact earnings management practices in the country . In the current scope of transforming the UAE into a critical player in the global economy, the government has provided some of the most attractive incentives for the private sector. This has made the scope of earnings management significantly flexible. Incentives such as tax exemptions and government funding mean that earnings management is mainly carried out for the purposes of attracting investors and further funding from financial institutions ([Alareeni, 2018](#)). However, foreign-based firms in the country can carry out earnings management as a way of managing the amount of taxes remitted to their native countries based on different laws and legislation. The incentives provided in the UAE for SMEs and start-up companies means that most of the earnings can be ploughed back into the businesses for further growth or can be retained as profits for the facilitation of future endeavours. Conventionally the UAE and other Middle Eastern countries lacked national accounting standards to provide a framework for earnings management. The country also lacked accounting and auditing organisations to facilitate accountability and earnings management. Stable accounting and reporting standards are key to the internationalisation of any country as they facilitate the provision of accurate and reliable information to inventors and other stakeholders. Even though earnings management may not be required locally, multinational companies require transparency as well as disclosure for the sake of accountability

frameworks in their native countries. The development of earnings management frameworks in the UAE has, therefore, been facilitated to a large extent by the entrance of foreign-based multinationals, the licensing of international banking and financial institutions in the country, the establishment of international accounting and auditing firms and modern technologies. Due to the infant nature of many business organisations in the UAE, earnings management has become a necessary undertaking in order to prevent fraudulent activities and to mislead financial information. It is only recently that firms in the country have been subject to studies on earnings management as structural reforms continue to be implemented ([Obeidat, 2016](#)). By adopting internationally recognised standards, the UAE seeks to reap the benefits of the global financial and capital markets. However, even though significant strides have made in this direction, implementation has faced challenges due to a culture that is not used to the new accounting standards and lack of regulatory and enforcement framework ([Amin et al., 2015](#)). Contradiction with Islamic laws is also a challenge that policymakers have had to contend with. Given that the UAE has been in the process of attracting international firms and investors, earnings management requirements are not strict. Firms in the private sector have a high level of flexibility in determining how to manage earnings and for what purposes ([Quttainah et al., 2013](#)). In addition to this, firms in the open or free zones are exempt from taxation and, hence, do not have to follow strict reporting procedures. Earnings management, in this case, is, therefore, carried out for internal business purposes or for accountability to shareholders. The grace period provided to these firms will provide adequate time for compliance and training of necessary personnel to oversee the processes. Even though the UAE is in the process of developing IFRS accounting standards, implementation is not strict, and firms are at liberty to exercise earnings management at their discretion. However, the presence of international accounting and auditing firms is critical in ensuring that these freedoms are not abused. In addition to this, firms that seek to compete on the international

stage are compelled to apply these standards, which limits aggressive earnings management practices.

Even as the UAE continues in its internationalisation efforts, Islamic culture has had a significant role to play in the economy. The economy, which was previously state-controlled, has progressively embraced the private sector. Even though the state accounts for more than half of the country's GDP, continued investments in the private sector have been improved by more than 90%. The Islamic culture and laws that are applicable in the country are notably harsh on individuals who perpetrate fraud in corporate circles, either in the public or private sector ([Quttainah et al., 2013](#)). Accrual-based earnings management is sometimes criticised as misleading and fraudulent, especially where strict controls are absent. From the strict point of view of Islam, it can be seen as manipulative, hence, not acceptable under the Islamic rules that govern the country.

For this reason, accrual-based earnings management is practised only to a small extent, especially by local firms. Real activities-based earnings management is preferable, especially with firms pushing for innovation and diversification as the country has received significant business interests from global multinationals and investors ([Obeidat, 2016](#)). In addition to this, multinationals operating in the country are likely to have adopted GAAP or IFRS in their respective native countries where they have already established earnings management frameworks which they continue to apply in the UAE. Sharia laws that are applicable to UAE firms reduce agency challenges that are associated with earnings management and increase transparency and disclosure. It is worth noting that there is a strong relationship between state-owned firms and earnings management ([Capalbo et al., 2018](#)). The state, in some instances, may have a high level of influence on earnings management practices. Given that the UAE GDP is more than 50% state-financed, earnings management may be politically influenced in

order to imply better performance; this is especially the case when a few powerful individuals have strong vested interests in the performance of such public entities.

Jordan is another example of developing economies. Jordan is considered to be an emerging economy. Therefore, it attracts lenders, suppliers, new investors and business players across the globe. Because of the phase of growth, the publication of earnings for external consumption is still a new phenomenon in the country. The need for enhanced accountability and transparency exerts pressure on the corporate governance mechanism, which increases the probability of earnings management ([Alabdullah, 2016](#)).

With the continued increase in globalisation of financial and business markers, Jordanian firms have increasingly been under pressure to provide quality information to enable investors to compare returns on investment and risks ([Al-Najjar, 2010](#)). The demands have linked the study of earnings management with corporate governance, particularly aspects of ownership structure. It is believed that ownership structure plays an instrumental role in determining the quality of reported accounting information ([Al-Fayoumi et al., 2010](#)). The efficiency of external monitoring determines the opportunistic management of earnings by various stakeholders, such as external block-holders and institutions. Instances of opportunistic earnings management can be reduced when the incentives or motivations of executives are understood. If top executives lack self-serving incentives to utilise earnings management opportunities, stakeholders may be less interested in monitoring discretionary accounting choices. In poor countries and emerging economies, such as Jordan, institutions may lack expertise or may strategically ally with the management. In this regard, instances of earnings management may be extremely common.

Before considering earnings management in Jordan, it is vital to understand its accounting system. Although Jordan is situated in a volatile region, it enjoys political stability, a liberal economy and an advanced stock market. Nonetheless, the economy is private sector-oriented

with very little state ownership. All registered firms are obliged to publish their accounts. Since 1987, the Jordanian Association of Certified Accounts has been inspecting the quality of the information provided by registered firms. The JACPA was established, based on the International Accounting Standards ([Saleem Salem Alzoubi, 2016](#)). Based on the Jordanian Securities Commission Law, all accounting standards, auditing and disclosures from publicly traded companies must adhere to the International Financial Reporting Standards (IFRS-. In 2002, the Securities Law 76 was enacted to pave the way for the creation of stock exchanges, the formation of an independent investor protection fund, adoption of stringent professional and ethical codes, and implementation of strict adherence to the rule of law. In 2003, the Accountancy Professional Law 73 was launched. This law led to the development of the High Council for Accounting and Auditing under the leadership of the Minister of Industries and Trade. Many analysts argued that the law had to be upgraded and refined to keep abreast of new global developments ([Al-Fayoumi et al., 2010](#)).

Jordan is a unique market because it has expressed significant interest in unifying the pillars of corporate governance. The nature of institutions in Jordan depicts an emerging economy. Overall, the market is characterised by immature block-shareholders, weak investor rights and a high percentage of insider ownership ([Al-Najjar, 2010](#)). In many Jordanian corporations, fundamental stakeholders include individual investors, banks, families, and social security institutions. Because of the nature of many Jordanian firms, managerial ownership is common. According to the traditional agency theory, when shareholders take managerial positions, they tend to align their interests with those of other shareholders. In managerial ownership schemes, incentives for opportunistic earnings management are very low. Efficient earnings management thrives with an increase in managerial ownership. The convergence-of-interest hypothesis states that insider ownership acts as a mechanism to discourage opportunistic executive behaviour and discretionary accruals.

In companies with a narrow separation between managers and owners, the managers may quickly receive pressure from the financial markets to communicate the firm's value to the market ([Almasarwah, 2015](#)). In such situations, short-term financial reports may not be strictly considered. It has also been argued that manipulation of earnings is likely to take place in managerial ownership systems. The absence of market discipline may encourage insiders to choose accounting options that mirror personal motives instead of sound economics. As managerial ownership increases, corporate control to enhance value-maximising decisions may be reduced. The reason is that high ownership by insiders equates to adequate voting power among them to guarantee future employment. Inadequate monitoring can occur in firms with high managerial ownership. The reason is that owners influence the type of monitoring mechanism to be applied.

[Almasarwah \(2015\)](#) conducted research in a bid to uncover the relationships between earnings management and corporate governance in Jordanian industrial firms. The research, which utilised a mixed methodology, identified a wide array of motivations for earnings management, including a desire to raise management compensation, to increase share prices, to attract more investors, tax avoidance and a reduction of customs fees. Just like other researchers, [Almasarwah \(2015\)](#) maintained that ownership structure instrumentally influences the direction of earnings management. The influence of ownership structure takes account of more than just the characteristics associated with the audit process or board of directors. Through interviews, the researcher also discovered that earnings management in Jordan was influenced by external economic factors and cultural factors. The tribal system prevalent in Jordan is a vital cultural factor because it results in pressure on certain entities, which is likely to increase earnings management. Pertinent external economic factors include the IFRS and the Middle East revolutions.

Jordan has a unique culture and legal system, and these play different roles in the formulation of the corporate governance mechanism based on political, economic and cultural circumstances. The current legal system is a mixture of British law, Ottoman Empire law and Islamic law. Commercial laws and corporate laws have been added to solve contemporary issues in business. Islamic law is applied in every aspect of life. The religious element in Jordanian governance has influenced the nature of the business environment by creating firms such as Islamic insurance firms and the Jordan Islamic bank, among others. Although tribal law is not written down, every sheikh of a clan is obliged to memorise various rules. Tribal laws are also applied to different aspects of life, including business. Apart from the tribal systems, there is a common practice of nepotism or favouritism within the business community, known as Wasta. Culture is a fundamental aspect of business in Jordan, and it cuts across education, business, politics, religion and social structure. The strong inclination towards strict Islamic teachings reduces the chances of opportunistic earnings management. Islamic laws and the tribal laws encourage members to embrace honesty, brotherhood, fairness and integrity ([Saleem Salem Alzoubi, 2016](#)).

Also, the taxation system in the country creates loopholes, which could be easily exploited by unscrupulous managers for earnings management. The country applies the Income Tax Law of 1985 to collect taxes both indirectly and directly. Tax rates in Jordan differ depending on a firm's activities. For instance, banks and financial firms, commercial firms, industrial firms, and communication companies pay income tax at the rates of 30%, 14%, 14% and 24%, respectively. In Jordan, depreciation tax is allowable, and firms are allowed to choose their depreciation policy. According to the prevailing tax law, businesses are allowed to reduce their tax bill by deducting expenses from their income to obtain net income tax. The existence of deductible expenses opens a window which can be easily exploited by managers to manipulate earnings management ([Healy and Wahlen, 1999](#)).

[Alzurqan and Al Sufy \(2011\)](#) identified the fact that earnings management in Jordan is positively affected by the audit committee size. Research has revealed that other qualities associated with audit play an instrumental role in influencing earnings management. For instance, a study conducted by [Nawaiseh \(2016\)](#) sought to predict the impact of the quality of external audit on earnings management. The study, which was based on Jordanian Banks listed on the Amman Stock Exchange, identified some of the leading proxies used in examining audit quality, such as affiliation with international auditing firms, audit fees and audit tenure. Moreover, other controlling variables were cash flow/total assets, return on equity, return on assets and financial leverage. The researcher discovered that audit tenure, audit fees and affiliation with international auditing firms significantly influenced relations with earnings management. The three audit quality indicators made it possible to predict future earnings management. Apart from the audit size, when an external audit is completed, earnings management can be reduced.

2.10.3 Earnings Management in Transition Economies

Russia as an example of transition economies, Russia has a different economic structure, which has a direct impact on how firms manage their earnings for different purposes. With the country relying heavily on extractive industries, firms in the industry are capital intensive and require significant resources to finance activities, such as exploration of natural resources within and beyond the country ([Ahmed, 2013](#)). In the restructuring process, the country has had to deal with a strict political direction that has had both direct and indirect impacts on organisational practices. Unlike the majority of emerging and developed economies, the largest firms are state governed. Overall, 70% of the national GDP in Russia is generated by state-owned companies, which means that earnings management is also controlled by the government to a large extent ([Malofeeva, 2018](#)). Laws and legislation are also geared towards facilitating earnings management for state-owned enterprises. Such massive penetration by the

state into the economy is bound to impose illiquidity on financial markets. However, the Russian government has, in the recent past, attempted to boost private firms through incentives such as flexible funding options. Given the considerable percentage of state-owned firms in Russia, the government holds discretionary power in terms of managing earnings based on the interests of the country ([Budrina, 2014](#)). This means that such earnings go into public use for the provision of own country principles to a significant extent ([Malofeeva, 2018](#)). Firms that comply strictly with either of the accounting strands are those with an international orientation where local laws and regulations bound their subsidiaries. In this regard, the discretion to apply either accrual-based earnings management or real activities earnings management is dependent on the goals and objectives of individual firm ([Budrina, 2014](#)).

Russian firms depend on Russian accounting standards, which are different from those imposed by GAAP and IFRS. The country has been in the process of transitioning to IFRS in a bid to be on a par with other countries and achieve integrated accounting and reporting standards. The Russian environment is still impacted upon by historical factors whereby tax authorities determined earnings management as opposed to accounting principles and regulations ([Ahmed, 2013](#)). The Soviet Union left Russia with a planned economy, which made it difficult to integrate it within the international market economy. The transition process has seen the emergence of private firms, which are still in the process of understanding earnings management requirements from local and international perspectives. In order to fit into the international arena, the government introduced RAS. In a bid to harmonise accounting standards with IFRS standards, as a requirement of the transition from a planned economy to a market economy. However, there are still significant differences in accounting standards, which have an impact on how earnings management is conducted within Russian firms. The transition process has been impacted upon by government bureaucratic practices, inefficiencies and corruption. In such a chaotic environment, firms can easily manipulate their earnings with

the result being reduced levels of information on accounting and compliance. Financial manipulation within Russian firms has been rampant due to the absence of an astringent regulatory framework ([Braam et al., 2015](#)). In this regard, firms are known to use unscrupulous techniques to avoid taxes and retain earnings. As a result, Russia has been associated with low-quality financial reporting due to illegal earnings management techniques. Russia has come a long way in terms of improving earnings management through the adoption of IFRS. As a result, it has been recognised as a formidable economic powerhouse on the international scene.

The international market has progressively accepted Russian-based firms as a new dedication to streamlining earnings management and reporting standards has become evident ([Budrina, 2014](#)). However, breaking from the old culture has not been easy and Russian firms are subject to significant scrutiny. As mentioned earlier, Russia is only beginning to exercise innovation in its firms. Therefore, earnings management was mostly carried out in an uncontrolled environment with aims such as reducing tax implications and misrepresentation of information to investors. Under the new set of IFRS accounting regulations that continue to be implemented in the country, firms are compelled to use a blend of accrual or real activities earnings management, based on their goals and objectives ([Ahmed, 2013](#)). Earnings management in Russia is mainly carried out for taxation and bank financing purposes and, in some cases, to meet investor expectations. For instance, discretionary accruals earnings management is expected to follow specific standards, or they would otherwise be considered to be irregular or involve fraudulent manipulation. Russian's firms practise income minimisation techniques, where earnings are managed downwards. This is mainly done in order to reduce the tax obligation accruing to individual firms. It reduces tax expenditure where saved earnings are used for organisational activities ([Budrina, 2014](#)). Until recently, earnings management for Russian private firms was mainly carried out with tax authorities as

to the primary users of financial accounts. With no set of clear regulations, firms were able to conceal real earnings and only remit a portion of the actual tax owed to tax authorities. Russian firms also use income maximisation, whereby earnings are managed upwards. This is mainly done to depict profitable ventures as opposed to struggling or loss-making ventures. Earnings management, in this scope, is mainly undertaken to attract investors or when applying for financing from banks even though these techniques are used elsewhere in the world. Most countries have regulatory frameworks which confine the extent to which the techniques can be used. The inadequate structural and regulatory framework in Russia has been an issue of concern as it becomes difficult to differentiate between fraudulent and genuine earnings management practices. This is the reason why the implementation and enforcement of strict IFRS standards are essential for the country. Income smoothing is also another form of earnings management used in the country ([Capkun et al., 2016](#)). Firms that have adopted the IFRS system have better quality earnings with regard to diminished earnings smoothing. Earnings smoothing is decreased by the use of IFRS standards and also improves the quality of earnings reported. According to [Ahmed \(2013\)](#), the scope of earnings management for Russian firms has changed from income maximisation to income minimisation after corporate governance reforms in 2001. Conventionally, firms manipulated their earnings reports to show positive performances in order to acquire internal and external financing and to attract investors as well. In this regard, instead of using the accruals technique to manipulate bad debts, expenses and allowances, Russian firms have undertaken earnings management using real activities, for example, techniques such as overproduction and management of costs to have an impact on the cost of goods sold as recorded in the financial reports. Due to the impact of the Soviet culture, many Russian firms were reluctant to disclose their financial information to the public as would be the norm in other countries. Following the inception of new rules of disclosure and corporate governance, it became mandatory for public companies to follow

corporate governance and disclosure rules which were laid down for them in order for them to be listed on the Russian stock exchange. The transition process has seen Russian firms change from being politically-oriented to shareholder-oriented. Earnings management has also shifted in this regard. Resistance to the new changes initially made transparency and disclosure problematic among Russian firms, hence making the country significantly risky for investors. The country has been rocked by multiple scandals in illegal and corrupt earnings management practices which have further shown the need for stronger regulatory and monitoring frameworks.

2.11 Chapter Summary

Earnings management have been studied by many researchers to understand the firms' manipulations. There have been many attempts to define earnings management. Some researcher stated that earnings management is the executive's professional judgment; others argued it is executives abilities to select the accounting choices. Recently, the researcher included executives operational choices too. In this research, we believe that each of these attempts has capture part of the definition and gathering them will provide a complete picture of the definition of earnings management. However, theses executives choices are motivated to achieve specific incentives such as market motivation, compensations, political reasons, earnings and taxations. Each of these choices is majored carefully by executives to make sure that the cost-benefit analysis is taken into considerations. Also, geography, religion, society and culture may provide a different outcome in terms of earnings management. According to the analysis, the elements, geographical, society, and culture, impact the level of earnings management. This PhD is aimed to examine the relationship between earnings management and innovation strategy based on economies' backgrounds. The researcher believes that as culture, geographical and society impact the level of earnings, the economies' level also impacts earnings management level. The researcher predicts that developed economies will

have lower earnings management compared to developed and transition economies as the legal system, the compensation structure and accountability are higher in the developed economies. Also, most accruals models, in deducting earnings management, measure total accruals as the dependent variable using either balance sheet - working capital - or cash flow approach. Some studies point to the importance of single accrual or several, and these studies examined a specific accrual account. Using total accruals may provide a comprehensive review, yet it is challenging to specify which account has more influence than others ([McNichols and Wilson, 1988](#)). Although accruals models provide earnings management measurement, they still suffer from various problems, for instance, omitted variables, ignoring firms' performance, and small or large samples. The selection of the best model to measure accruals is subjective and based on research objectives. Accruals manipulation can exercise accounting choices, for instance, selection of the biased estimation, late adoption of standards, and deportation methods. These choices impact earnings either upward or downward. Although many researchers have adjusted standard Jones and Modified Jones, the models are still the most effective way to measure discretionary accruals. One of the adjusted models was the performance match models, which was proven that firms performance should be taken into consideration when examined the earnings management. Recently, the Peasnell model has become popular among researchers. Therefore, this PhD intends to use all of the models to deduce the discretionary accruals. In real activities models, there are fewer models compared to accruals models. Both the Roychowdhury and Gunny models indicated that executives' decisions are the key to manipulate discretionary expenses and productions. [Roychowdhury \(2006\)](#) indicated that the manipulation in this method is "departure from normal operational practice". According to [Ronen \(2008\)](#), the real activities model suffers from wrong assumptions and may result in a biased result when applied to a large or small sampling. From the researcher's point of view, these models must be approached with some caution because normal operation activities levels

can change over time and situations. In the researcher's opinion, the best approach is to examine earnings management using more than one approach to avoid models' problems, biased results and provide comparison results.

3. Chapter Three: Innovation

3.1 Introduction

Here we examine prior work and go on to propose our methods for innovation. This chapter provides a review of relevant studies on innovation and its relationship with earnings management; This is anticipated to offer sufficient background for the researcher's hypothesis and this study's methodology. The chapter starts with the definition of innovation strategy. Next is the classification of innovation strategies; This will offer a rational explanation on selecting specific classification in this research. After that, innovation strategies and research development, leadership and innovation strategy Are addressed. As this study focuses on and investigates research and development expenditure in firms, a brief clarification of research and development standards will offer an explanation of executives' choices when it comes to research and development. In addition, the relationship between earnings management and cash flow, innovation, information asymmetry and agency theory; This tends to offer the executives competitive advantage strategies and its consequences, and it will offer the impact of selecting innovation strategies on firms directly and indirectly. Finally, innovation strategy in developed countries, developing countries, and economies in transition are discussed.

3.2 Conceptual Definition of Innovation

The concept of innovation has been defined and analysed by different industries, researchers and businesses in varying publications, but there does not appear to be agreement. For instance, [Walker \(2014\)](#) defined innovation as the delivery of change as well as the successful exploitation of new ideas that lead to economic value as well as a social value. Innovation creates new ideas and improves existing ones in order to realise a competitive advantage and economic growth. [Arundel et al. \(2015\)](#) documented the importance of doing things differently

because it is unrealistic to do things in an identical way to others. Therefore, they asserted that there must be changes in strategies through innovation. They described innovation as a combination of strategies for production, such as producing new goods, opening new markets, offering new ideas, accessing new resources, securing new intermediaries as well as restructuring organisations. Innovation could be thought of as a specific form of change or discontinuous change which simply demonstrates a radical break from past activities. According to [Shaw et al. \(2005\)](#), the definition of innovation, the level of innovation and the outsourcing of innovation are determined by each firm which engages with it. For [Chaney et al. \(1991\)](#), innovation is the fundamental aspect of economic growth and development. For [Zahra and Covin \(1994\)](#)), innovation is an essential need in the growth of firms. For [Kamm \(1986\)](#) innovation was considered as a future investment and [Ittner and Larcker \(2001\)](#) saw innovation as being first and leading the market, stating that innovation exists when individuals, firms or public services institutions provide new wealth or enhance an existing resource. [Drucker \(2002\)](#) describes innovation as one of the two significant essential functions of an organisation, [Lumpkin and Dess \(1996\)](#) defined innovation as a process which improves and delivers value to customers, suppliers and an organisation by producing different procedures, solutions, products and services. For [Popa \(2014\)](#), innovation involves new approaches that managers take, whether those be policies, structures or products. Although differences of opinion on innovation still exist, there appears to be some agreement that firms are driven by innovation, which is a fuel for growth and enhancement. Prior research that defined innovation as technology has serious weaknesses since it offers too narrow a definition of innovation, since innovation is a combination of ideas, whether in terms of a new product, new methods of producing a product, services or a new market. Firms in all industries pursue innovations in order to react to the changes in a firm's environment, whether internal or external. However, the firm's specific industry may influence innovations unequally. Some

industries, such as the technology and medical industries, require more innovations. In addition, firms' abilities to adopt innovation in the same industry vary, as does the definition of innovation.

3.3 Classification of Innovation Strategies

To be able to measure innovation, we must be able to categorise it. With regard to the typology of innovations, it has been the subject of various researches. Most of the studies have focused on the differentiation between product and process innovations([Utterback and Abernathy, 1975](#)) and technical and administrative innovations([Evan, 1966](#)). [Damanpour \(1991\)](#) presented innovations in three categories: administrative innovation, technical innovation and process innovation. [Jeppson and Nathan \(2012\)](#) categorised them into in-house research and development and acquiring patents from third parties, while [Kogabayev and Maziliauskas \(2017\)](#) demonstrated innovation types as position innovation, product innovation and process innovation. As determined by the Guidelines for Collecting and Interpreting Innovation Data, (OECD), there are many types of innovation: product, process, marketing and organisation. Product innovation comprises goods and services, and process innovation is associated with technological developments. [Gailly \(2018\)](#) product innovation is defined as an executive framework for developing new products or services that have an external focus to meet the customers' desires ([Rainey, 2008](#)). Likewise, [Utterback and Abernathy \(1975\)](#) defined product innovation as new products or services presented to meet consumers' needs and stated that process innovation is more concerned with presenting new components that enhance products and services in firms.

Similarly, recognised the innovation process as an idea to increase the production cycle. Technical innovation is defined as those activities that occur in the technical system of organisations and which focus on products and/or services. Technical innovation involves products, services and/or processes. On the other hand, administrative innovation is defined as

those activities that occur within management and appear in the organisation's structures, administrative processes, authorities and/or rewards ([Popa, 2014](#)).

[Dzisah and Etzkowitz \(2008\)](#) indicated that there are many specific categories of innovation. It is primarily classified into four types: process innovation, product or service innovation, governance innovation and conceptual innovation.

In conclusion, it is almost sure that the measurement of innovation is not consistent since it is hard to measure processing or a new method by financial terms. However, whether processing, product or administrative innovation, each type is centralised around finding or buying ideas that enhance a firm's ability to increase its market share, in other words, searching for an idea and developing it or adapting it from a third party. What can be clearly and identified by financial terms from an accounting perspective with regard to the measurement of the innovation strategy is that research and development and acquiring patents are the most accurate measurement of innovation. However, the researcher acknowledges that the value of innovation should be based on the outcome of the innovation; for instance, an increase in market share. Based on that, the researcher measured innovation as the search for and development and acquisition of patents.

3.4 Leadership and Innovation Strategy

Numerous elements influence innovation strategies, such as the organisational environment, whether that is internal or external, technical feasibility and leadership. Leadership has the power to influence followers to achieve specific objectives. These objectives have been transformed by leadership into a specific strategy. The strategy has been widely looked at by prior studies. According to [Jeppson and Nathan \(2012\)](#)), there are two forms of business strategies: cost leadership strategy and differentiation strategy. To pursue a cost leadership strategy effectively and to increase market share within a specific industry by supporting a

low-cost implementation strategy, leadership tends to implement several activities, such as accurate demand forecasting, technological improvement and outsourcing ([Kaliappen and Hilman, 2014](#)). Firms that adopt cost leadership strategies tend to focus on forming products that are least expensive relative to other organisations in the same industry because their consumers are less concerned about the product's name [Semuel et al. \(2017\)](#).

Leadership in both strategies tends to invest in innovation. Innovation will enhance the production and manufacturing process and marketing, which will consequently enhance the organisation's market share and production process quality, and reduce the cost of productions and delivery, which will ultimately increase earnings. However, increased earnings are linked to more profitable organisations. Nevertheless, non-profit organisations, such as governments, tend to adopt innovations too, which can perform better by enhancing their social services to the public ([Hull and Lio, 2006](#)).

Prior studies have indicated that firms have minimised their marginal costs through investment in innovation, whether it is achieved by internal or external research and development ([Tsai et al., 2011](#)) In line with this, [Jeppson and Nathan \(2012\)](#) specified that executives make decisions on how to invest in innovation, selecting whether to use in-house research and development, acquire patents, or both. Executives following the in-house strategy have to maintain their ability to generate enough funds to support the research and development activities. On the other hand, acquiring developed products from other parties does not require long-term cash flow. In this strategy, when purchasing incurred.

[Kouaib and Jarboui \(2016\)](#) provided evidence that the executives' psychological and demographical behaviours were associated with real earnings management in innovative firms. Their study showed that the examination of executives' profiles was critical in innovation firms as the executives had a final and robust impact on innovation strategy; especially when executives are overconfident, more experienced and educated, they take risks and invest more

in innovation. *‘The study of this relationship is mainly noticed by the accounting choices adopted by leaders (uses of accruals, estimates, and accounting policies. ([Kouaib and Jarboui, 2016](#)).*

Executives’ psychological and demographical behaviours are associated with real earnings management as executives have a tendency to achieve upward earnings through, for example, reducing discretionary expenditures and reporting lower costs of goods sold. This results in additional patents and more exceptional innovative achievements for sets of research and development expenditures. That study involved several limitations; however, namely: 1) the size of the sample of the studies, which was reduced to 190 European firms due to unavailable data; and 2) the complication of collecting data on executives’ behaviours. Ovation and executives not being under pressure to generate ongoing finance [Jeppson and Nathan \(2012\)](#).

3.5 Innovation Strategies in Economies

3.5.1 Developed Economies.

Firms in developed economies have always been the leader of innovations. This reflects the income states of the countries, as firms in a developed economy can afford to fund innovation and have quicker future economic benefits as the household income in these countries is higher than other economies. For instance, the United Kingdom has spent hundreds of millions on developing a technology to enhance their services.

One example of a country in the developed economies in the United States of America. The US is a leading innovation hub with other countries adopting best practices developed there. The country has some of the biggest global brands that have spread worldwide after years of innovation, research and development. In this regard, the innovation strategies employed by US firms differ significantly to those of other nations. Some of the most common global brands have their foundations in the USA, and the trend has continued in subsequent centuries

([Guillén and García-Canal, 2009](#)). The innovation culture in the USA has resulted in some of the most successful business brands in the world today. For instance, huge companies such as Ford, the Coca-Cola Company, Microsoft and Apple, among others, are all US-based firms with branches and franchises all over the world. Being one of the most developed countries in the world, the US continues to be a pivotal source of innovative ideas that are replicated in different parts of the world through different business models. The developed nature of the country means that rival organisations are always looking out to remain relevant and competitive through innovation. In addition to this, new start-ups continue merging with technological advancements and inventions play a crucial role in this sense. Innovative start-ups have been some of the critical drivers of innovation in the US economy in the 20th and 21st centuries ([Dushnitsky and Lenox, 2005](#)). The US has been a global leader in the development of technological innovations, which have been emulated elsewhere in the world. However, even though there have been some significant breakthroughs in innovations, not all have made it to the level of creating business and consumer value ([Council, 2008](#)). This is due to uncertainties revolving around new innovations that have not been replicated in other scenarios. As opposed to investing in already known competencies, the pursuit of innovations is highly uncertain and requires in-depth resource management and extensive research and development. The innovation strategy applied in the US is mainly based on internal markets, and the need to add consumer value. This strategy is inherent in most successful firms in the US, which undertake progressively market-driven innovations to enhance performance and maintain long-term stability. In a survey conducted by Fast Company in 2012, five American companies were placed as the top five most innovative companies: Apple, Google, Facebook, Amazon and Square. This survey shows that the culture of innovation is deep-rooted in American firms ([Fleming et al., 2007](#)). However, other countries seem to be catching up with the innovative culture even as their global percentage of GDP increases. Nonetheless, when

compared to other nations, the US still leads in terms of novel-product innovations ([Autor et al., 2016](#)).). This is especially true from a technological point of view, an area which is significantly advanced in the US. There are multiple US companies that are pioneers of products and services used around the world. In fact, the most valuable brands in the world and novel-product based companies are from the US. This form of innovation is related to the invention. The reason why the US companies are dominant in this form of innovation is that the US economy is globally-oriented with a significant number of organisations seeking to have a worldwide outlook as opposed to limited national or regional scope ([Tavassoli and Karlsson, 2015](#)). Novel-product innovation in the US has also yielded a considerable industry in incremental and process innovation ([Lyytinen et al., 2016](#)). Based on ideologies from novel-product innovation, incremental and process innovation have yielded more industries and markets that continue to further drive both forms of innovation ([Autor et al., 2016](#)). In addition to these two forms of innovation; business model innovation in the country has also helped in the growth and sustainability of many US companies. Business model innovation keeps on changing, based on consumer preferences and market behaviours, which are affected by multiple factors. For instance, Ford had the innovative idea for the Model T series, but it only became economically viable through the business model of mass production and the mold-breaking model of car pricing. A similar example is the iPod by Apple which involved an innovative combination of hardware and software ([Olleross and Zhegu, 2016](#)).

A unique model to support innovation emerged in the US in the 1970s through trial and error with innovation policy conforming to immediate and international markets. The innovation policy aimed to eliminate barriers and take advantage of the rewards for firms willing to take risks and generate change ([Tavassoli and Karlsson, 2015](#)). As a result, individual firms became central to novel innovations which were then transformed into specific products. After World War II, novel- product and incremental and process innovations were mainly undertaken by

large companies in an in-house manner. Most of these organisations worked in the defence and civilian markets and had significant human and financial resources to utilise in the research and development processes. Such firms included Boeing and GE which continue to engage in innovation processes to this day. Innovation in these organisations is also driven by collaboration between specialists in different fields, which has further enhanced innovation in a vertically integrated model. However, as the world rapidly began to change, the innovation strategy for US firms also changed after the major corporate restructuring of the 1970s and 1980s. Innovation shifted to mainly focus on core competencies with the approach being centred on specific stages of production. The result of this was the development of new forms of investment and financing as the innovation ecosystem became increasingly fragmented. In the current scope on innovation strategies in the US, start-up driven approaches have become common. In the contemporary approach, innovation models have changed with new regulations enabling the creation of financial markets and facilitators, such as venture capital, which allows the attainment of financial gains within a short period of time. Technology clusters in the US also thrive under the start-up model with Silicon Valley being a good example. Industrial clusters utilising emerging technologies have proven to have an effective, innovative approach within the scope of contemporary US firms. This innovation strategy is critical in addressing market challenges as well as driving social and information networking ([Tavassoli and Karlsson, 2015](#)). Successful cluster innovation that is currently taking shape in the US is also determined by contemporary social networks that facilitate the circulation of knowledge through formal and informal institutions. This model of contemporary innovation strategy has worked well for the US with support from policies from national and state policies that support the approach ([Teece, 2010](#)). This has led to the creation of a pool of intellectual property rights that protect the innovations and further promote progressive innovation and continued entrance by newcomers.

Studies in the US have shown that firms that give priority to innovation in their corporate strategies have superior shareholder returns in the long run. A majority of company executives in the US agree that innovation, precisely, enterprise innovation has been pivotal in driving business portability and stability ([Trejo-Pech et al., 2015](#)). In this regard, a significant number of US firms use enterprise innovation to generate and maintain brand prestige. Innovation strategies in the US are also driven by recent findings which have shown that innovative firms which have innovative strategies in their corporate blueprint have higher profit margins than competitors in the same industry. However, even with innovation being an essential element of organisational growth and sustainability, it occurs randomly in most organisations in the US. Most innovations are also incremental in nature as opposed to involving novel-product innovations. Most organisations realise that innovation is key to their future sustainability, but they do not have an explicit strategy to facilitate this ([Teece, 2010](#)). Even though the US ranks highly in terms of innovation; there is a general lack of governance, hence resulting in the concept being underdeveloped from a contemporary point of view ([Wallace, 2017](#)). Trends in the country show that firms that fail to incorporate innovative strategies in their development blueprints are likely to fail in the future regardless of size and current market orientation. The sluggish innovation in the US, despite having huge potential, is also blamed on a few innovation-oriented employees and leaders within organisations.

Another example is Canada. Innovation is a crucial element for Canadian firms and the Canadian economy in general. However, the country also lags in this respect when compared to other countries in the same economic tier. The country has had challenges in the areas of innovation and productivity when compared to other developed countries. It ranks poorly at position 15 out of 18, which further shows the need to revamp innovation strategies in major industries in the country ([Nicholson, 2009](#)). Labour productivity, which is critical for innovation strategies, has fallen from 90% in the 1980s to 75%. Multifactor productivity has

been associated with the challenges being faced in innovation strategies which relate to an inadequate combination of labour and capital in the main sectors of the economy. The country has adequate capital and workforce to facilitate high levels of innovation; however, investments in information and communications technology have been found to be weak when compared to other countries at the same economic level. This has also stagnated the growth of multifactor productivity with challenges being exhibited in aspects such as the organisation of work, applied business models, research and development and application, entrepreneurship and incorporation of new technologies in production processes. After experiencing a collapse of the technology boom at the beginning of the 21st century, innovation levels in Canada have progressively dropped and remained below the Organisation for Economic Co-operation and Development average. Research and development investments have dropped by more than 20%, considering and comparing to the GDP levels in the country. This trend resulted, in particular, from a low contribution by the manufacturing sector when compared to countries like the US.

An example of innovation is the investments in machinery and equipment embodying innovation strategies, especially in the production of capital goods within an economy. It is a primary channel which promotes innovation and provides a blueprint for growth within specific industries, both locally and internationally. This form of investment enables the creation of new innovative processes in production processes. Growth in this respect facilitates progressive innovations in machinery and equipment ([Baldwin et al., 2002](#)). Even though Canada continues to make significant investments in machinery and equipment, it still lags due to the low level of incorporation of technologies, which further promotes innovation in terms of the production of novel products and the enhancement of existing processes. The average investment per worker in terms of information and communications technology in Canada is 60% when compared to the same scenario in the United States.

The business strategy employed by firms determines the innovation strategy and overall performance thereof. In this regard, innovation strategies come down to the choice of business strategies employed by Canadian firms. The innovation business strategy chosen helps to put innovation into motion in terms of how elements, such as capital investments, research and development, external enablers and human capital, interact to yield the products of innovation. Products of innovation include new products and services, continuous improvement of existing products and services, as well as the expansion of existing markets and creation of new ones ([Baldwin et al., 2002](#)). The products of innovation are then measured by the level of capital deepening, level of MFP growth and workforce capabilities. There are long-standing features of the Canadian economy that have an impact on the level and nature of innovation strategy in the country. One of these factors is the fact that Canada positioning is upstream in multiple industries in North America ([Doloreux, 2004](#)). In this regard, Canada is more of a commodity supplier to its local and international markets and an adopter of technology as opposed to a creator of technology. The upstream position of the country limits access and contact with a massive pool of end-user consumers beyond its boundaries. Most continentally integrated value chain systems pose a disadvantage to the country due to its geographical positioning. When compared to countries such as the US, access to end consumers, who are a significant source of innovation strategies, is lower and ultimately shapes how businesses choose strategies and innovation therein (Baldwin et al., 2002). Innovation strategies for Canadian firms are also limited by the fact that the domestic market in the country is geographically fragmented and also small in size. In most instances, innovation is risky in nature and may result in huge losses if not properly managed and implemented. As a result, most Canadian firms are risk-averse when compared to the market size they serve. Large companies with international orientation are likely to engage in innovative ventures when compared to most small businesses that only serve internal markets. The potential reward for innovation is

deemed to be lower than the level of risk involved in engaging in aggressive and ambitious innovative strategies. Incentives for innovation are, therefore, low and firms opt to maintain the status quo or engage in random innovation strategies to ensure that businesses survive in the long term.

3.5.2 Innovation Strategies in Economies in Transition

An example of innovation in transition economies is Russia. The Russian economy is significantly different from other economies across the world. The Russian economy is based on a tradition whereby the former Soviet system still has an influence on how firms operate. Russia is regarded as one of the fastest emerging economies in the modern world ([Smirnova et al., 2011](#)). Emerging economies have been credited for coming up with unique, innovative ideas as opposed to the conventional models which imitate Western countries that are considered to be more developed. In the past, these economies were just seen as a source of cheap labour and capital. However, in the contemporary world, they are coming up with disruptive technologies and innovations that are being emulated all over the world. Russian firms inherited Soviet science and technology, which has played a significant role in maintaining a stable economy despite rocky relationships with some Western nations ([Väättänen et al., 2011](#)). Even though elements of Soviet management are still present in modern-day Russian firms, the break had a significant impact on the path taken by innovation within firms. Russia relies heavily on oil and natural resources, which account for about 80% of exports. This means that most firms in the country are focused on this as the primary industry ([Väättänen et al., 2011](#)). Innovations also revolve around the industry with pace-setting contributions that are recognised worldwide. However, with oil and other natural resources being exhaustible in nature, Russian firms are looking to a future in which such natural resources will be depleted. In this regard, Russian firms are looking for innovative strategies to diversify and break away from sole dependency on extractive industries

([Smirnova et al., 2011](#)). Some of the strategies include multinational acquisitions and reinvestments in other sectors overseas. The Russian government also recognises the need for diversification and offers incentives for innovative companies that are independent of the oil and gas industry. This is not only an economic agenda but a political one as well. Economies that rely on the petroleum industry tend to be less innovative as the industry is entirely developed with minimal room for innovative ideas. Innovative ideas are mainly in the support industries, such as banking and technological infrastructure. In this regard, due to multiple restrictive regulatory measures, Russian firms lag on the innovation scale when compared to advanced economies such as China and Japan. Protection of intellectual property rights, which are central to innovation, is not well developed in the country.

Due to an intensified focus on the oil industry, availability of resources and finances for innovation purposes in some sectors is problematic. Investments in ICT also hamper technological innovations in the country. The research and development in the country do not meet the gaps in public demand, and the country is compelled to look for external solutions instead of homegrown solutions ([Smirnova et al., 2011](#)) It is only recently that the government has introduced incentive systems for private research and development with a view to fostering innovations. In 2011, the country was ranked 71 out of 142 countries with regard to innovation ([Chadee and Roxas, 2013](#)). However, the country ranked highly in terms of innovation potential, which shows that it has the capacity and resources required to facilitate innovation in its companies. The ranking is low when compared with other emerging countries at the same economic level as Russia, however. Even though Russian companies may not be involved in cutting-edge inventions, the country has the capacity to commercialise innovation in different industries through imitation. This trend is robust in Asia and has seen some emerging nations in the continent become leaders in innovation. Larger companies are especially at an advantage as they enjoy little competition and economies of scale and can also access long-

term financial assistance from local and international financial institutions. Large firms also have access to resources that can help in terms of up-scaling imitative innovations. However, in the Russian context, this assumption does not apply as it would be expected for large firms in the country. Low innovation among large Russian firms has been associated with specific features inherited from the Soviet legacy. Under the Soviet Union, innovation levels were high, especially in the field of science and technology ([Chadee and Roxas, 2013](#)) . Restructuring after the fall of the Soviet Union dominated activities for Russian firms; however, with innovation being considered a risky undertaking.

The new command economy did not encourage innovation as it was seen as disruptive and short-term in nature in the context of the existing economic structures ([Klochikhin, 2013](#)). After the shift to the market economy from the command economy, many organisations were struggling to survive, and innovative strategies were perceived as risky investments that would not yield results in the short term. This situation has been a significant hindrance to innovation in the country, as the impacts are still being felt to date ([Filippov, 2011](#)). Policymakers in the country have only recently started making strides towards promoting innovation after realising that other emerging nations are experiencing robust economic growth from innovative strategies. It may take a while to change the status quo, especially with other limiting factors, such as an inadequate regulatory environment, weak protection laws, inadequate intellectual property rights and a lack of collaboration between the public and private sectors. In fact, the restructuring of large manufacturing companies is ongoing with a preference for closing down instead of employing innovative contingent strategies ([Klochikhin, 2013](#)). Compared with firms in Western countries, large firms in Russia are less likely to be innovative or have an innovative strategy.

Extractive industries in the country dominate the economy, representing more than 80% of all industry. Innovation strategies for these firms are limited. In this regard, the structure of the

Russian economy is, therefore, a hindrance to intensive innovation strategies. This means that training and labour in the country are mainly channelled into accommodating the broader economy that is lacking in innovation strategies. It is estimated that only 1% of the country's national income is spent on research and development. Out of this, 75% of research and development activities are carried out by public institutions. The private sector in the country is also reluctant to employ intensive innovation strategies. Industries that are innovation and research and development intensive, such as the electronics and biotechnology industries, are underdeveloped in the country([Filippov, 2011](#)). It is only recently in the 21st century that Russian firms have started innovative internationalisation strategies such as the creation of overseas subsidiaries and acquisitions. Some Russian firms have expanded into the Asian region, Latin America and Africa, among other regions in a bid to diversify and compete in the international market. This innovative strategy has been applied widely by Western and European countries, and Russia is only just beginning to have an impact. However, foreign direct investment (FDI) by Russian firms remains scarce as well as research and development in this respect. The problem is rooted in the structure of the Russian economy, which is mainly driven by extractive industries. They are low tech in nature with the share of high-tech firms being marginal. At the level of private companies, it is estimated that less than 9% of income is spent on research and development. The result is weak innovation strategies in the private sector, as well. The government has been blamed for focusing on the public sector and offering low incentives for the private sector to be innovative. Innovative SMEs in the country in the field of science and technology is estimated to be a mere 2% of all SMEs in the entire country. The low levels of innovation have also made data collection problematic in the country ([Veselovsky, 2017](#)). The government has attempted to promote innovation in the country but has had mixed results. It represents one of the country's political agendas as it seeks to take advantage of its immense wealth and natural resources. In 2007, the

Governmental Commission on High Technologies and Innovations was established with one of the roles being to oversee and foster innovation in the public and private sector ([Filippov, 2011](#)). Another agency, the Commission for Modernisation and Technological Development of the Russian Economy, was created in 2009 through which the government began providing funding and incentives for firms to engage in innovative ventures. The government has also embarked on the creation of innovation blueprints such as the National Innovation Strategy 2020. The government also has plans to construct the Skolkovo Innovation Centre which is predicted to become the Russian Silicon Valley ([Veselovsky, 2017](#)). This is expected to boost innovations for start-up companies and technology-based firms. The new endeavours towards promoting innovation are expected to develop high-tech products that will compete on a global scale.

3.5.3 Innovation in Developing Economies

An example of developing countries is the United Arab Emarat. The UAE has experienced a remarkable transformation in the last fifty years to become a global economic powerhouse and travel destination. The country has used its wealth from natural resources to develop infrastructure that has transformed the desert country into a business and economic hub ([Faried et al., 2017](#)). The country is used as an example of how effective management of natural resources can be used to transform economies and create immense wealth and an internationally oriented economic hub. The same model has been replicated in other Arab countries like Saudi Arabia and Qatar, but the UAE has emerged as a top country with immense wealth and economic capabilities. The country has some of the best wages in the world with multiple benefits for employees and investors in different sectors of the economy ([Hameed et al., 2016](#)). The main sectors of the economy are controlled by the government, which is headed by royal families which oversee the different developments in the country. Innovations in the country are based on the fact that, in a few years' time, oil resources will

start dwindling. Hence the country has to have an alternative economic model that is not based on the oil industry. As a result, the country has managed to attract international investors who have transformed the country into a formidable force in the global economy. The UAE has been used as an example of how innovation can transform countries and the lives of the citizenry. The country has managed to achieve this in record time and continues to invest heavily in different industries to enhance innovation strategies further. The national leader in the country believes that innovation is the future with robust investment plans and blueprints that are embedded in the national strategy. By creating a business-friendly environment, the economy has attracted entrepreneurs from all over the world in a bid to achieve high productivity and competitiveness, which is driven by innovative research, science and technology. The UAE innovation model is unlike any other in the world. The country has been ranked first globally in terms of attracting global talent. The country has been able to attract the best talent in multiple industries where they are provided with lucrative professional and personal perks ([Faried et al., 2017](#)). The leadership in the country recognises that creating a formidable pool of human resources is key to progressively enhancing innovative capabilities in all sectors of the economy. According to the Global Innovation Index, the country has steadily risen so that it is now among the top 40 most innovative countries in the world, ranking 36th in 2014. Investments in innovation are estimated to be worth approximately AED 14 billion annually with 50% of the investments going into research and development ([Al-Khoury, 2012](#)). This ranks the country as the most innovative Arab country in the world.

Innovation from a national point of view is overseen by the National Innovation Strategy. The agency is tasked with the responsibility of prioritising innovation sectors and planning accordingly. The key pillars identified by the agency include the creation of an enabling environment for innovation from a global perspective, innovation champions and identification of crucial innovation sectors ([Madichie, 2011](#)). Innovation priority sectors include renewable

and clean, transportation, technology, education, health sectors, water and space. These sectors have been deemed to be critical for the continued growth and sustainability of the public and private sectors. An enabling innovation environment in the country is based on a regulatory framework that facilitates entrepreneurship and investments from an international perspective ([Faried et al., 2017](#)). Technological infrastructure is also deemed to be critical in terms of bringing the world to the UAE, and vice versa. An enabling innovation environment is also dependent on the availability of enabling services. The UAE is also keen to provide incentives to local and international investors.

Innovation in the UAE is, in no small extent, facilitated by the government. The private sector has also taken advantage of an enabling environment with adequate infrastructure and incentives to facilitate innovative processes. Government initiatives such as UAE Vision 2021 and the Dubai Integrated Energy Strategy 2030 show the commitment towards becoming a leading and sustainable economic powerhouse ([Al-Khoury, 2012](#)). One of the remarkable features of innovations strategy in the UAE is that it has only taken a few decades to transform the country in a way that other nations have been struggling to achieve for many years. Effective management of national resources has enabled the country to achieve a great deal and be an example to many nations. The country has used its current wealth and resources to create future value and wealth through innovation. By engaging international players, the UAE has been used as an example of innovation in multiple cases ([Al-Abd et al., 2012](#)). For instance, through a private company partnership, the Dubai Municipality was able to develop a lighting system that reduced energy consumption by more than 90%. The Dubai Lamp is predicted to replace more than 10 million lights in the city with other cities in the country adopting them as well. Through public-private partnerships, the country has developed infrastructure that has facilitated the growth of the private sector in the country. For instance, Dubai and Abu Dhabi airports have helped to link the country with the rest of the world with

airlines in the country developing to become top carriers in the world. This has led to the country being ranked among the top five with regard to global competitive indices, a position which it would not have held a few years back.

In order to promote innovation in the country, the UAE government embarked on a three-strategy approach from a general perspective. One of the strategies entails the establishment of free zones where local and international business can thrive in an enabling environment with multiple incentives. Setting up of financial centres to facilitate businesses is also a strategy being used and financing of the private sector is a critical element of the innovation strategy. The UAE has also invested heavily in education in order to ensure that it develops local talent with professionals who can effectively facilitate the growth, sustainability and development of the economy ([Abou Hana, 2017](#)). An analysis of innovation in the UAE reveals that the country has focused mainly on process improvement as opposed to the making of novel products ([Al-Abd et al., 2012](#)). Diversification of the country's economy away from solely depending on oil revenues has significantly transformed it. Progressively, more innovators and start-up companies are setting up shop in the UAE, with most multinationals seeking to have a share of the rapidly growing economy. Forward-thinking business clusters have also become common with some of the world's most innovative companies shifting their focus to the country. Innovative programs, such as the Dubai Internet City, have multinational companies which have incentives such as repatriation of 100% capital, tax exemptions and rent-free space for 50 years ([Al-Abd et al., 2012](#)). Conventionally, the country has been oriented towards the national government. Government eldership has been responsible for overseeing the management and utilisation of national resources. Using public wealth, the leadership in the country has recognised the importance of the private sector, hence the attractive incentives. This has seen a boom in the private sector in the UAE with funding from the government, especially for SMEs and start-up companies.

Innovation in Jordan is considered to be underdeveloped and needing improvement. The innovation system in Jordan has not yet developed enough to connect the innovation components, and there is much work needed in order to enhance it so that it becomes stable. The politics and war in the region impact Jordan's economy, and Jordan has suffered from an increasingly high percentage of unemployment. According to (Jordan Unemployment Rate, 2019, p. 1) the “*jobless rate in Jordan increased to 19 percent in the first quarter of 2019*”. The Global Competitiveness Report 2018 stated that Jordan achieved 59.29 points out of 100 in the rankings for the most competitive nation in the world, which is lower than its score for the previous report in 2017, due to issues surrounding skilled workers, quality in training, teaching and a decline in research quality and quantity in research institutions. In addition to a decline in quality in education, the education system in Jordan does not encourage innovations. Universities lack innovation strategies and lack of leadership to pressure for effective policy toward innovation. [Nusair et al. \(2012\)](#) studied Jordanian employees in public firms in order to understand the leadership, transformational and innovation behaviour in Jordan. The study provided evidence that leadership styles have an impact on innovation behaviour in public firms. Also, [Obeidat et al. \(2015\)](#) examined the knowledge of executives and the impact of innovation in telecommunication firms. The study documented that there is strong evidence that knowledge management has the most significant impact on innovations. However, there are only a few innovation centres in Jordan, such as Hamdi Mango, and National Energy Research. However, these centres do not function effectively due to a shortage of funds. [Bates and Khasawneh \(2004\)](#) examined the organisational culture in 28 Jordanian firms and found that there is a relationship between organisational innovation and organisational learning culture. Another study examined the impact of innovation on the banking sector in Jordan. [Abou-Moghli et al. \(2012\)](#) study examined 25 banks in Jordan to identify the impact of

innovation on time, quality, cost and flexibility. The result indicated that innovation in banks has a positive impact on time, cost, quality and flexibility.

3.6 Summary of Economies Comparative Analysis

From the analysis of the countries, innovation strategies play a crucial role in economic growth and sustainability. The economies examined have varying levels of innovation and also rank differently in global innovation indices. The developed ranks the highest, followed by the developing and transition. Innovation is showcased by the level of internationalisation achieved by individual countries. For instance, the US has some of the largest multinationals that operate in a majority of countries in the world. Such firms include Google Microsoft and the Coca-Cola Company. Out of the four countries, the US leads in terms of creating novel products. Driven by a substantial domestic and international market, the US also leads in terms of process-based innovation strategies. However, the US fails to meet its full potential for innovation when compared to other innovative and relatively smaller countries such as Finland and Sweden. The levels of innovation are not on par with GDP levels.

On the other hand, despite having a relatively stable economy and the stock market, Canada lacks capacity when compared to other nations. Innovation in the country is mainly driven by foreign companies, as characterised by the few Canadian based multinationals. On the other hand, Russia, as an economic transition, relies on the extractive industry for economic growth and sustainability, which has negatively impacted innovation in the country. Russia has also, for a long time, been associated with business risk due to its Soviet, socialist history, which continues to impact innovation in the country negatively. In developing economies, The UAE has shown significant levels of innovation by using its wealth from natural resources to create an enabling and attractive environment for innovation and entrepreneurship, from an international perspective. It has set records with remarkable transformations driven by innovation and effective resource management. It has continued to improve in the innovation

ranks and is deemed to be a preferred business hub and destination. Finally, in developing countries, Jordan has a lack of resources, and its position in the region places much stress on the economy. This translates into less innovation than other countries. From these examples, we can draw a conclusion that, even within a single economy, the innovation ranks differently, cases in point being Jordan and the UAE or Canada and the USA.

3.7 Nexus Between Earnings Management and Innovation Strategy

Earnings management mainly affects earnings reports and, thus, in turn, those stockholders and potential investors who use the earnings reports to make decisions about whether to invest or continue to invest in a firm. Various strategies allow executives to manipulate the earnings reports, such as real activities, income smoothing and the use of accruals. On the other hand, innovation is associated with the uncertainty of future economic benefit. Executives are under pressure to consistently provide the funds needed for innovation, particularly in firms where the in-house research and development approach is taken. In addition, executives are under pressure to meet expectations regarding earnings. To do so, many executives engage in earnings management activities.

However, investing in research is classified as expenses which are, in general, costly and risky ([Bange and De Bondt, 1998](#), [Kor, 2006](#)) stated that some executives decide not to deliver a significant level of funds to research and development. The reasons for not committing to the funding of research and development are linked to job security and personal gain ([Claessens et al., 2000](#)). the fear of failure of the innovation, which may result in lawsuits, and tax consequences ([Cherensky, 1994](#)). However, [Jeppson and Nathan \(2012\)](#) recognised the appearance of research and development projects that may encourage executives not to deliver the funds, which are: research and development involves a higher level of uncertainty and is more time-consuming, requires consistent cash flow, has limited collateral value and involves higher termination costs.

Uncertainty is defined as the existence of numerous outcomes as a result of an action. In research and development, uncertainty relates to the risk that the outcome of the project may not be desirable.

[Guidara and Boujelbene \(2014\)](#) acknowledged that there is uncertainty in research and development when the market is unable to evaluate the project outcome. Investors understand that there is a fundamental relationship between uncertainty and research and development, especially at the beginning of a project, since the risk is higher. Management is aware of these kinds of risks too, so they may choose to delay or reduce their investment in uncertain projects. [Ridha and Bajka \(2010\)](#) indicated that, due to the time between the decision to invest and the outcome of an investment, the impact of research and development is hard to evaluate. Also, the size of the substantial impacts on the research and development investment-uncertainty relationship. The larger the firm, the less concerned it is with market uncertainty ([Czarnitzki and Toole, 2008](#)). Other authors, such as [Holmstrom \(1989\)](#) have argued that large organisations tend to invest less in innovation as they are less likely to take risks. Conversely, small organisations, specifical start-ups, have the ability to invest in the development of a new idea. In developing economies, the uncertainty is more of a problem than in developed countries, since they do not have the mechanisms in place to deal with it ([Samset, 1998](#)).

The funds for investment either arrive from debt or equity. In research and development, the funds are associated with the tradeoff in some cases. The static trade-off theory, according to [Ridha and Bajka \(2010\)](#), suggests that the firm selects the level of debt to receive tax benefits. Executives have a tradeoff between the benefit of the debt and the risk associated with the uncertainty of the outcome of the project. Many papers, such as [Brown et al. \(2012\)](#) have discussed the challenges related to financing research and development projects. ([Brown et al.](#)) indicated that cash flow and external markets are the primary sources of financing for research and development for young, tech firms. Relevant research in this field was conducted by [Kerr](#)

[and Nanda \(2015\)](#) they argued that bank finance is a significant source of finance for innovation, primarily in large firms. [Jeppson and Nathan \(2012\)](#) documented corporate research and development investment characteristics that make them different from other investments, and these are: the human capital in research and investments is the most significant percentage of the amount; there is uncertainty associated with the development of a product, and the investments in research and development are long-term investments. [Hall and Lerner \(2010\)](#) argued that wages and salaries make up more than 50% of research and development spending, along with the uncertainty of outcomes, which also provides strong evidence that small firms have a higher cost of capital than larger firms.

To measure the innovation investments made by firms, we must analyse the in-house patents and the purchases of patents; specifically, research and development expenses. The higher the level of research and development, the more the firm is committed to innovation. As a result, the performance of firms would be superior to that of firms that are not committed to spending on research and development. Prior studies, such as that by [Oswald and Zarowin \(2007\)](#) show that earnings management results in reducing the research and development expenses and treating it to achieve particular objectives. In addition, the studies show that executives utilise real-activity-based earnings and accrual-based earnings management to accomplish individual intentions.

The real activities strategy is used to adjust reported earnings to accomplish an inevitable result ([Liu, 2014](#)). The alteration of earnings is mainly achieved by applying changes to the structure and timing of operations, or financing or investment transactions. [Graham et al. \(2005\)](#) presented two examples of real activities manipulations in their research: 80% of CFOs have altered reported earnings by decreasing research and development and advertising funding, and 55% would defer a new project.

On the other hand, accrual-based earnings management is an action to change the reporting income in a particular direction by either changing estimations for doubtful accounts or changing accounting methods, such as depreciation methods of fixed assets for specific transactions in financial reporting.

[Markarian et al. \(2008\)](#) documented that executives are motivated to manipulate the cost of research and development in order to achieve earning-smoothing purposes. Additionally, they provided additional empirical evidence on executives' motivations towards the capitalisation of research and development costs by using the Tobit regression model to test their hypotheses. The study utilised the annual reports which revealed the research and development activities of all non-financial firms listed on Italy's Stock Exchange. Publishing the total research and development expenditures (research and development capitalisation) was the main problem they faced when collecting the data since firms in Italy's stock market only publish aggregated data for research and development and advertising expenditures, which was not enough to generalise their empirical results for European countries. Finally, two variables were used as proxies for measuring in-house strategy (change in return on assets over the average of the prior two fiscal years and firm's operating income divided by the total assets of the firm). The findings show that those firms which report lower returns on assets have more potential to capitalise research and development expenditures. On the other hand, those firms that report high-quality performance are very likely to expend the cost. Also, no relationship was found between debt financing and capitalisation decisions.

[Jeppson and Nathan \(2012\)](#) examined firms with an innovation-focused strategy engaged in earnings management. The study examined managers' use of income smoothing, real activities and discretionary accruals for earnings management purposes. The results of the research indicate that firms with innovation strategies report a more significant percentage of earnings. In the context of the USA, [Shust \(2015\)](#) argued that there is a significant relationship between

research and development and earnings management. This study highlights the power of the relationship between research and development and earnings management by utilising the modified Jones model, presented by [Dechow et al. \(1995\)](#) as a proxy to measure estimated values of earnings management. The empirical evidence suggests that the study provides a significant definite link between research and development and discretionary accruals.

Other studies have attempted to explain earnings management through discretionary expenditure and the impacts of firms' tax on management decisions. [Lee and Swenson \(2011b\)](#) examined earnings management through discretionary expenditures in the USA, Canada and Asia with the impacts of firms' tax on management decisions. Using data collected from Global for all US, Canadian, Hong Kong, Korean, Japanese and Taiwanese firms from 1990-2007, and the researchers applied the Jones model, modified by [Kothari et al. \(2005\)](#). The study result shows that the firms' tax impacts executives' earnings decisions, especially for companies that operate in higher tax rates, such as those in Canada and the US, which are very likely to utilise the real earnings management to accelerate discretionary expenditures.

The result of this study is significantly significant as it shows the impact of tax by providing strong evidence on the use of discretionary accruals and real discretionary expenditure in research and development selling, general and administrative expenses (SG&A) and advertising. The result of such a deduction might reduce the financial reports to the required level. However, the limitation of the study is that it has not provided a reasonable explanation of why tax rates do not impact Korean and Taiwanese firms. On the other hand, the research has provided explanations for Japanese firms '*whose consistently high effective tax rates suggest that firms do not aggressively manage their taxes*' .. and for Hong Kong, 'where marginal rates are low, making some tax planning less important' ([Lee and Swenson, 2011a](#)).

[Nagar and Radhakrishnan \(2017\)](#) studied and measured reductions in research and development expenses, SG&A expenses and COGS by executives in order to meet the

earnings benchmark of avoiding losses. To measure the reductions, the study utilised cash flow components to categorise firm-years into their life cycle stages as follows. Firms with negative cash flow from investing and operating activities but positive flows from financing activities (introductory); firms with negative cash flows from investing activities but positive flows from operating and financing activities (growth); and firms with negative cash flows from investing and financing activities but positive flows from operating activities (decline).

The results of the study indicated that the firms' investors in the introductory stage do not expect the firms to meet their earnings target and the executives are less likely to cut spending to meet the benchmarks. On the other hand, executives of the firms in the growth stage are likely to cut spending to meet the benchmarks.

The limitation of the study presenting the classifications of firms' stages is that the management of the life cycle stage from cash flow could affect the outcome of the research. For instance, shifting the time of payments and delaying the innovation expenditure will result in variations in the classifications of the firm's stage. Also, the result was based on a few years, and the proxy is measured by using cash flows of one year since the researchers here address this concern for a period of three years.

They have produced one of the most important studies in this field, as it provides an analysis of executives' methods to manipulate the earnings (reducing discretionary expenditures or capital investments over accruals manipulation). The examiner tested whether the firms with innovation strategy are involved in earnings management, whether innovative firms' strategies and real activity-based earnings management are associated, and whether innovative firms' strategies and accrual-based earnings management are associated. The research found that there were mixed results regarding whether the firms with innovation strategy engaged in income smoothing; the evidence showed that those firms which adopted innovation strategy were less likely to use real activity to manage earnings and that firms with innovation

strategies were more likely to use accrual-based strategies to manage earnings. There were numerous limitations of [Jeppson and Nathan \(2012\)](#) study; its various controls, which were drawn from previous accounting literature, the models might be considered wrongly specified and the size of its sample, as a large number of observations were removed because they were absent from commercial databases.

[Garanina and Nikolaeva \(2016\)](#) examined earnings management in developed and developing countries on the basis of research and development treatment. The study aimed at analysing the motives for engaging in earnings management based on the accounting treatment of research and development costs from companies in both developed and developing countries (Russia and Germany). The findings indicated that executives of both developed and developing countries engaged in earnings management utilising research and development expenditures. However, the incentives for developed and developing countries differed. Russian firms were more involved in capitalisation research and development expenditure to encounter debt covenants. On the other hand, German firms were more interested in diverse types of earnings management incentives, such as earnings smoothing. *‘German managers are more concerned about the attitude of investors because this manipulation leads to the improvement of the market valuation of the company and investors see a stable performance and less risk’* ([Garanina and Nikolaeva, 2016](#)). The limitations of the study are as follows: 1) the sample size of Russian companies is larger compared to the sample size of German firms; 2) there were omitted factors, such as executives' compensations, which might impact the result, as such information was not available; and 3) the motivation of earnings management demonstrated by various factors, such as the level of regulation and control, rather than accounting principles, and such a link has not been demonstrated in the research.

In conclusion, as mentioned above, many researchers have examined the extent of earnings management practices, whether in developed, developing countries or countries in transitions.

Most of the studies above have provided strong evidence on the use of the accrual-based approach and real activities when executives manipulate earnings. These studies have focused on techniques used by executives through the process, mainly research and development. All of the studies indicate the manipulation of earnings by executives in developed, developing countries and countries in transitions, but the incentives differ. We can argue that there are factors that may have an impact on executives' decisions to engage in earnings management, which vary, depending on the specific country or continent.

3.8 The Relationship Between Cash Flow and Innovation Strategy

Executives can manage their earnings using either real activities transactions or by taking advantage of the flexibility in accrual-based methods. According to [Zang \(2011\)](#), executives tradeoff between real activities and accrual-based models, depending on their costs. The real activities involve actions taken to modify the reporting of earnings in a specific direction in order to achieve specific goals. These actions can be prevented by changing the time or structure of operations, investments or financial transactions. On the other hand, accrual-based methods are accomplished by changing accounting methods or estimations.

In a prior study, [Cohen and Zarowin \(2010\)](#) indicated that executives might prefer to utilise the real activities because accrual-based approaches are likely to draw the attention of auditors and regulators, as opposed to making real decisions, such as the product price and expenditures on research and development. Also, the accrual-based method is riskier since it is possible to manipulate accruals after the end of the fiscal year. **P**ointed out that executives cannot manipulate real activities at the end of the year. His study stated that executives practise real activities, such as reducing discretionary expenditure in order to improve earnings. Firms prepare cash flow statements on the principle of cash basis, which is not subject to accruals basis impact. As previously discussed, firms may select their innovation strategy, whether this involves in-house research and development or the purchasing of patents. The in-house

strategy requires consistent cash flow to keep a project flourishing ([Hall, 2002](#)) and when research expenses are entirely written off in case a product was found to be viable or abandoned and was produced commercially ([Damodaran, 1999](#)). When investors are reluctant to invest in a firm due to insufficient information and the uncertainty of future economic benefit as a result of the in-house strategy, executives have no other option but to use operating income to fund the in-house strategy. Therefore, executives may prefer to engage in accrual-based methods as this has less impact on the firm's cash flow ([Cohen and Zarowin, 2010](#)). In addition, since the accounting standards require to expenses the research and development expenditure due to the uncertainty of future economic benefits, executives are more likely to engage in earnings management using real activities approach by reducing the research and development to increase the current earnings. As a result, executives will more often opt for the strategy of purchasing patents rather than in-house alternatives.

According to [Hill and Jones \(1992\)](#) that investing in the negative net present is the agency problem. [Cheng and Warfield \(2005\)](#) argued that executives tend to invest in an unprofitable project when cash flow is available due to the lack of growth opportunities. However, these kinds of project will impact the future earnings and directly will impact the stock value; as a result, minimise the impact on the stock, executives engaged in accruals manipulations

3.9 Research and Development Standards

Most firms around the world follow either US GAAP, IFRS, or local GAAP. The Financial Accounting Standards Board (FASB) and Accounting Standards Board ([IASB](#)) are the two globally promulgated standards; FASB publicises US GAAP and IASB publicises IFRS.

Under US GAAP, the accounting treatment for research and development costs in article ASC 730-10-25-1 indicate, in general, that research and development costs must be expenses in the income statement as incurred. US GAAP expenses, the research and development costs as future economic benefits are uncertain. Similarly, IFRS accounting treatment of research and development has changed over the years. Research and development come under IAS 38 Intangible Assets, developed in 1997 under Exposure Draft E9 Accounting for research and development activities. The last update of the standard took effect in January 2016. The initial recognition of research and development expenditure, as stated in IAS 38, is: all research costs must be expensed, and development costs are to be capitalised provided that the firm is able to complete the whole project by providing technical and commercial feasibility to either uses the asset or sell it (Deloitte, 2018). [Gong and Wang \(2016\)](#) studied the difference between US GAAP and IFRS firms in nine countries; they found strong evidence that the value of research and development expenses significantly declined after adopting IFRS in countries requiring immediate expensing or where a capitalisation option is allowed.

The main difference in both standards is the treatment of development costs. IAS 38 requires firms to meet specific criteria in order to capitalise the development costs, which are, according to the standard (Deloitte, 2018, p.9):

- (a) Technical feasibility of completing the intangible asset so that it will be available for use or sale;*
- (b) Intention to complete the intangible asset and use or sell it;*
- (c) Ability to use or sell the intangible asset;*
- (d) How the intangible asset will generate probable future economic benefits. Among other things, the entity can demonstrate the existence of a market for the output of the intangible*

asset or the intangible asset itself, or if it is to be used internally, the usefulness of the intangible asset;

(e) Availability of adequate technical, financial, and other resources to complete the development and to use or sell the intangible asset; and

(f) Ability to measure the expenditure attributable to the intangible asset reliably during its development.

IFRS requires firms to provide disclosure on development costs. One of the essential studies on disclosure was by [Chen et al. \(2017\)](#) who examined high-tech firms that follow IFRS and GAAP. The study documented the importance of voluntary disclosures for investors and the impact of the disclosure on stock prices.

In Summary, the researchers concluded that there is no concern about the treatment of research and development. IFRS makes a distinction between the research and development phases. Within IAS 38, the intangible assets that arise from the implementation of research should be expenditure and recorded as expenses, once incurred. The reason for not capitalising the assets is that it is impossible to determine whether there is a future economic benefit at the research stage. In the development phase, the project can be recognised as an asset only once the firm can demonstrate its criteria. Overall, IAS 38 provides executives with the option to estimate whether the project meets the criteria.

3.10 Information Asymmetry and Innovation

Information asymmetry refers to the management's ability to observe a change in investment assets, whereas the outsider is only able to perceive the information that is available in the

market. [Barbaroux \(2014\)](#) argued that information asymmetry involves mixed behaviours. It can be a foundation for opportunities and a source of market failures once the condition exists. Moreover, information asymmetries impact on the contractual arrangements with shareholders. [Himmelberg and Petersen \(1994\)](#) specified that information asymmetry issues are different across industries. Managers in specific industries, such as the drugs industry, have more information than those in other industries. [Aboody and Lev \(2000\)](#) also indicated that information asymmetries exist in every substantial investment; nevertheless, they vary based on investment types. [Joseph and Wintoki \(2013\)](#) demonstrated that information asymmetries are more likely to be linked to research and development. They went on to state that research and development for a specific project, in areas such as software or pharmaceutical development, is hard to evaluate in terms of its future economic benefit; therefore, it is hard to measure for outsiders. Also, investors are unable to compare research and development across firms. [Aboody and Lev \(2000\)](#) indicated that the extent of information asymmetry plays a significant role, as the more substantial the asymmetry is, the more it impacts on investors' decisions.

Moreover, the research identified several elements of information asymmetry. First, investors are unable to gather information about research and development in order to evaluate the organisation's performance. Second, there are no organised markets for research and development, such as other financial assets or physical assets, which results in a problem in terms of evaluating research and development. Third, investors receive no information on the change of asset value from research and development since it reports as an expense on the financial reports as the standard required.

[Davis \(2001\)](#) argued that the organisation is not concerned with developing a new product, preferably in exploiting the associated information asymmetries. Firms can use one of the following approaches in respect of the information asymmetries in research and development.

First; they can publish the findings for legal protection. Second; they can refrain from publishing the information externally. Third; they can publish part of the information on a timely basis. Fourth, they can publish all of the information. [Davis \(2001\)](#) continued to explain that even these strategies are exposed to others; patents can be overstepped, and secret information can be exposed or abused. Information asymmetry issues have been discussed using agency theory. According to this theory, information asymmetries create numerous problems: moral hazard, adverse selection, and hold up ([Ceric, 2014](#)). The focus here is on approaches for minimising information asymmetries in research and development. [Ceric \(2014\)](#) illustrated numerous strategies to minimise information asymmetries; one of the most important was developing corporate culture and trust. [Tumay \(2009\)](#) pointed out that moral hazards occur when one party cannot observe the other party's actions. [Williamson \(1989\)](#) specified that moral hazards present a double problem in research and development: *'with research and development effort not being observable each partner will focus on its profit when choosing its effort level... the moral hazard problem is solved by monitoring'* ([Morasch, 1995](#)).

3.11 Agency theory and innovation strategies

In a firm, one party (shareholder) hires the second party (executives) to manage the business. The executive is required to present a true and accurate financial statement at the end of fiscal periods. These financial reports are used by stakeholders to evaluate the business performance and the value of the business. During the fiscal year, executives are faced with several professional judgements, and they are required to issue decisions in the best interest of the shareholders.

Nevertheless, executives have their incentives to achieve, which may or may not align with the shareholders' best interest. This is called an agency problem. According to [Walker and Florea \(2014\)](#) agency problems can lead to misrepresentation of financial statements when executives use their professional judgements.

Earnings management studies are rich and varied, from incentives and opportunities to agency conflict, as well as the executives' ability to utilise the financial reports using loopholes in accounting standards and the alternatives from real operational activities. Agency theory has been associated with earnings management in prior researches and refers to the relationship between the principal and the agent, whereby the latter perform services on behalf of the former; these services involve decisions and accounting choices. However, the services executives provide should be for the benefit of the shareholders, whereas agency theory states that there is a chance that executives select accounting choices to benefit themselves over shareholders. In addition, researchers have argued that the agency theory is not just between the principal (shareholders) and the agent (executives), where the information asymmetry is in risks ([Jensen and Meckling, 1976](#)). Nevertheless, also between shareholders, as shareholders are not equal in power since the more powerful shareholders take decisions in their favour ([Gilson and Gordon, 2003](#)). between the owners and the creditors when the shareholders take precarious investment decisions while creditors are not on the board ([Damodaran, 1999](#)).

According to [Chowdhury \(2012\)](#) the causes of the agency problem between the principle and agency are the different attitudes towards risk investment between executives and shareholders, the independency of the decision where the ownership is separated from the control, and the unsatisfactory nature of executives' incentives plans. As a result of agency theory, information asymmetry arises where executives have all the information while shareholders depend on executives to deliver the information, but some of the information might not be delivered in the same manner. [Pearce and Zahra \(1991\)](#) stated that an effective governance mechanism is one of the tools to reduce the agency problem. [Hastori et al. \(2015\)](#) argued that a giant board is essential to reduce agency problems, while [Panda and Leepsa \(2017\)](#) proposed the independence of the board. However, argued that the board's selections put more power in the executives' hands, as most, if not all of the board, are hired externally, whereby they have no information about the firms. While executives and shareholders are aware of agency problems, executives are still required to perform their duties and issue decisions. One of the essential choices executives make is to invest in innovations because this is associated with growth and renewal ([Ettlie, 1998](#)). However, investing in innovation is risky; the failure rate is high and impacts current earnings ([Myers, 1977](#)). [Mudambi and Swift \(2014\)](#) argued that investing in innovations is always beneficial, not only for the firms but for society as well. Also, any reduction of innovation should be justified by executives in a timely manner. The research failed to acknowledge that when executives reduce innovation, they are able to justify the reduction or that they could increase innovation for specific incentives that benefit themselves.

3.12 Relationship between Earnings Management and Purchase

Innovation Strategy

It is argued that executives utilise accruals-based strategy when dealing with in-house, research and development strategy as it will have less impact on cash flow ([Trejo-Pech et al., 2016](#)). [Jeppson and Nathan \(2012\)](#) acknowledged the gap in the research with respect to the purchases of patents. Also, the study made a significant contribution to the literature as it provided strong evidence on how both strategies, real activities and accrual-based, strongly impact patents. Their study attempted to investigate the impact of accrual earnings on firms' patent purchases and the short- and long-term impacts of such investments on the value of the firm. It is argued that executives utilise accruals-based strategies when dealing with an in-house research and development strategy, as it will have a direct impact on cash flow.

On the other hand, executives are more likely to utilise real activities when acquiring patents, since executives should consider when and at what cost to purchase patents and may worry less about the volatility of cash flow. Their finding indicated that executives' earnings management decreased patent investments. [Bereskin et al. \(2018\)](#)) documented evidence that a decrease in innovation in-house results in a decrease of patents. Similarly, other studies documented that reducing innovation to meet earnings target impact patents scale in the firms. These studies' results are based on the assumption that in-house innovation will transfer to patents and will generate future earnings. Reducing spending will eventually reduce innovation. [Bound et al. \(1982\)](#), [Czarnitzki and Toole \(2008\)](#) reported the relationship between funding innovation in-house and the increase of patent and earnings, while [Jeppson and Nathan \(2012\)](#)) reported evidence on the positive relationship between patent and accruals manipulations, which indicates higher patents. In addition, their study reported that executives prefer to purchase patents over in-house innovation when they reached a high level of accruals manipulations. [Zheng \(2019\)](#) argued that firms with patents engaged in earnings manipulation

more than firms with no patents. However, the study failed to analyse the relationship between patent and earnings management and why firms with patents could manipulate financial statements. Our opinion is that firms with patents would have higher future cash flow, higher earnings and higher performance than firms with no patents. As a result, executives may attempt to reduce earnings by engaging in downstream manipulations. In addition, different industries have different patent and different values, for instance, technologies and healthcare compared to customer services. Researchers should be careful and consider industrial classification when attempting to examine patents. [Hall et al. \(1984\)](#) found no evidence to support the relationship between innovation in-house and patents. However, the research acknowledged that successful in-house innovation led to patents, but did not examine earnings management.

Chapter Summary

Innovation has been the fuel of economic growth and success for firms around the world. It is agreed that knowledge is an asset that is very important for investors to have. Innovation strategy is a vast subject. It has been a central focus for scholars in the last decade. Each industry has identified and classified innovations according to their need and management. Based on the discussion above, one may consider that innovation is the ability of a firm to internally or externally generate ideas that add value to a specific part of the firm or the firm as a whole. Also, a possible explanation for the numerous definitions of innovation may be that innovation is identified based on innovative attributes, such as type of innovation, stages of innovation and nature of innovation in dissimilar industries. Executives who applied R&D, and purchased patent strategies, have realised the difficulty in managing innovation within each firm. Specifically, in terms of research and development. Given the fact that executives are operating in a climate of uncertainty in terms of the outcome of the product. In addition, there are information asymmetry and moral hazard problems. Information asymmetry occurs

when one side has better information than the other side. In this case, it is between investors and potential investors. Reducing information asymmetry through disclosure has a limited impact since firms hesitate to disclose their innovations to their competitors. Moral hazard refers to conflicting goals between two parties – in this case, ownership and executives. The problem of moral hazard can result in two situations. First, executives may spend money on activities that do not benefit the ownership. Second, there is '*a reluctance of risk-averse managers to invest in uncertain research and development projects*' ([Hall et al., 1984](#)). The researcher's point of view is that there is a direct link between innovation and earnings management. Executives are concerned about funding the innovation, but, at the same time, the innovation is uncertain, costly, tax consequences, and risky. So, executives may tradeoff between sacrificing current earnings in order to support innovation or cut the innovation to boost earnings, each choice having its advantages and disadvantages. Nevertheless, whether executives select to support innovation or to eliminate, they are going to misrepresenting the financial reports to either allocate more resources to innovation or reduce innovation to have higher earnings.

4. Chapter Four: Hypotheses Development and Methodology

4.1 Introduction

This research is motivated by the lack of research and explanations of earnings management's effects on innovation strategy in different economies. In this chapter, the researcher reviews the methodologies employed by prior researchers and adopts and justifies the methods utilised in this paper to examine the research hypotheses. Next, it provides research design, sample and data. Also, it provides the variables employed in this PhD to test the research hypotheses and the reason for selecting the variables. Finally, discuss hypotheses development.

4.2 Research Methodology and Research Paradigm

The The objectives of this section are to present and demonstrate what a research model is, which includes ontology, epistemology, theoretical framework and methodology, as offering attractive methods to be used in this research.

For many years, the distinction between quantitative and qualitative research has been debated and discussed ([Becker et al., 1998](#)). Methodologists have utilised great effort to provide guidance to qualitative and quantitative researches. Also, while methodologists have debated the quality criteria of research methodology, this has involved substituting new terms, for example, validity and reliability to imitate interpretivist ideas ([Seale, 1999](#)).

As a researcher, providing an explanation on selecting and rationalising a suitable research paradigm to be used is an essential stage in conducting social science research. [Easter-Smith et al. \(2002\)](#) delivered explanations for the fundamentals of research philosophy: First, it enables the researcher to obtain new understanding by utilising a new methodology of which the researcher has no prior expertise and knowledge. Second, it serves the researcher in refining

and identifying research techniques related to the researched phenomena. Third, knowledge of research philosophy benefits the researcher to judge the variations among research methodologies and methods and, therefore, avoid using inappropriate methods in the initial stages. Each researcher has their own perspective of what creates knowledge. As a result, these views and opinion provide a guide to the way researchers' beliefs and assumptions about a society frame how they interpret that society, which is what social scientists call a paradigm ([Guido et al., 2010](#)). According to [Barnes \(1982\)](#), a research paradigm is a theory, and a belief system shared among scientists with respect to how problems are going to be understood and approached. Put differently, and it is a framework for researchers to utilise as a basis. [Guba \(1990\)](#) presented the characteristics of research paradigm through their ontology, epistemology and methodology. This research examined each of the characteristics to determine the suitable research philosophy for this research.

4.2.1 Epistemology (Interpretivism and Positivism)

The The origin of the word epistemology is from the Greek words episteme, which is knowledge, and ology, which is the reason. [Grix \(2010\)](#) defined epistemology as the possible processes of obtaining an understanding of social reality, whatever it is understood to be. In other words, epistemology concerns the question of what creates adequate knowledge in the field of a study. [Richards \(2003\)](#) as our perspective of knowledge. According to [Gunzenhauser and Gerstl-Pepin \(2006\)](#), epistemology is the way we view the world that contains the understanding of the knowledge and how we can obtain the knowledge. [Maynard \(1994\)](#) stated that epistemology is concerned about the way to ensure that the obtained knowledge is adequate and legitimate. According to [Jill and Roger \(1997\)](#) research philosophy has two epistemological positions: interpretivism and positivism.

The positivism paradigm is the approach that investigates studies with elaborate sets of facts and associations between those facts [Avramidis and Smith \(1999\)](#). The positive paradigm accepts that there is a particular reality that can be measured and known; as a result, researchers are expected to use quantitative methods to measure this reality. Research results from using the positive paradigm approach might be considered restricted to some degree as the findings are generalised ([Almasarwah, 2015](#)).

On the other hand, as maintained by [Bryman \(2008\)](#)), the interpretivist paradigm is an alternative reaction to the positivist restriction. Interpretivism requires researchers to interpret the foundations of the study. According to [Babbie and Mouton \(2001\)](#) interpretivism purposes of understanding people. By way of explanation, interpretivism is more about understanding and interpreting everything ([Collis and Hussey, 2013](#)). The criticisms of interpretivism are that the method that is being used (Interview) does not allow generalisation ([Hammersley, 2009](#)), and the backgrounds and characteristics of the researcher impact the research; and it cannot generate universal result law ([Almasarwah, 2015](#)). [Joseph et al. \(2014\)](#).

Characteristic	Positivism View	Interpretivism View
Purpose	The researcher will predict and, moreover, illustrate changes from the forensic knowledge of participants	The researcher will attempt to interview the participants and identify the value and depth of the individual content
Beliefs	• One truth exists • Must be objective	• Many truths and realities • Different people have different perceptions, needs and experiences
Research Methods	Quantitative	Qualitative
What Study Data is Based On	Measurable outcomes from questionnaire data	Descriptive, explanatory and contextual words of interview data
Study Sample	Clear and precise inclusion and exclusion data	Representatives who are able to provide expertise from different points of view.

TABLE 3.1. Summary of Research Paradigms, Source: Michel (2008).

4.2.2 Descriptive and Inductive

In order to draw attention to different factors in this study, the study moves towards examining two approaches related to epistemology, descriptive and inductive. The inductive approach starts with observations, and the assumptions are generalised ([Zalaghi and Khazaei, 2016](#)). On the other hand, the descriptive approach develops a theory based on actual theories and creates a research plan to examine the findings ([Wilson and Wang, 2009](#)). However, the lack of participation from corporations limited this research to one approach. As a result, this research examined the deductive approach, which is linked to the positivist paradigm.

4.2.3 Ontology

The origin of the word of ontology is from the Latin word “antologia” as well as from the Greek word for “to be”. As stated by [Hanson \(2018\)](#), the ontological concerns link to the nature of reality and its features. Ontology is “*claims and assumptions that are made about the nature of social reality, claims about what exists, what it looks like, what units make it up and how these units interact with each other. In short, ontological assumptions are concerned with what we believe constitutes social reality*” ([Blaikie, 2000](#)). This reality is created by individuals who have been involved in the research process ([Maali and Jaara, 2014](#)). [Hanson \(2018\)](#) stated that multiple realities exist in a given situation and that realities are subjective. On the other hand, reality is realised as objective and independent from the researcher and it is a singular reality ([Hussey](#)).

TABLE 3.2. Summary of the ontology a researcher

<i>View</i>	<i>Summary</i>
Objectivism View (Independent)	Reality exists independently of our beliefs or understanding, Reality is objective, and it is a single reality
Subtle Realism View	Reality exists and is created by a researcher.
Constructivism View	Reality exists dependent; there are multiple realities

4.3 Research Methodology and Research Method

The research methodology is defined as “*a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically*” ([Kothari et al., 2005](#)). The research methodology is acknowledged as one of the essential components of the research procedures. It provides the researchers with an intellectual comprehension of the issues that need to be considered and suitable methods.

[Burrell](#) ([Burrell](#)) argued that there are two dimensions in conceptualised social science research, namely, subjective and objective. The subjective dimension contains the following paradigms: ideographic, voluntarism, nominalism and antipositivism. Similarly, the objective dimension contains nomothetic, positivism, realism and determinism. To examine the impact of earnings management on innovation strategy, this PhD research adopted a quantitative methodological approach. Quantitative methods contain estimated earnings management values by utilising accruals models, and real activities model. Also, using t-test and quadratic discriminant analysis to explore the link between innovation strategies variables and earnings management.

In every framework of the research procedure, the researcher should be able to answer descriptive research questions, the researchers' point of view and observations on the subject of research, how the researcher collects and analyses the data, and how variables in the subject of research connect to one another. As a result, the researcher must identify the models that will be used in the research and appropriate procedures that have been followed to appoint a specific model.

Based on the previous discussion on paradigm incommensurability, the researcher decided on a quantitative methodology study to utilise in this research. The researcher believes that the quantitative method will provide value to the research by increasing validity in the findings. However, utilising the quantitative method to not only examine the relationships between earnings management and innovation strategy but also provide comparisons among earnings management models.

4.4 Hypotheses Development

4.4.1 Innovative Firms vs Innovated Firms and Earnings Management

Researchers agree that firm executives can engage in strategic earnings management in order to direct their investment prospects, as far as innovation is concerned ([Roychowdhury, 2006](#), [Cohen and Zarowin, 2010](#)). The flexibility of accrual-based earnings management methods allow executives to manage their firms' earnings strategically, based on accrual accounting standards, while on the other hand, a firm's executives can strategically manage earnings through earnings management methods based on real activities. Previous research has revealed a number of reasons that firms may engage in earnings management. For example, according to [Dechow and Sloan \(1991\)](#), firm executives may use accrual-based earnings management to manage reported earnings in order to benefit from new laws and regulations in the market.

In an effort to reach organisational earning benchmarks and impress organisational shareholders, however, management may cut down on discretionary accruals. Furthermore, organisations may facilitate transactions through related organisations or parties to avoid the intervention of authorities. With regard to activity-based earning management, researchers agree that firms can boost total sales by increasing price discounts and offering credit advances to loyal clients; overproducing and decreasing the cost of goods sold so as to increase final inventories; or taking further initiatives to cut discretionary spending, which may include funding for research and development and advertising ([Jeppson and Nathan 2012](#)).

Based on this understanding of different methods employed by firms, as well as the reasons behind earnings management, this PhD study predicts that firms that use an innovation strategy are more likely to manipulate their financial statements, since firms that use this approach require a continuous injection of capital over a long period of time. This implies that the organisational management in firms who use this strategy must perform proper reviews and understand the need to have suitable sources of cash available for continuous injection into

research and development projects. Another factor that must be considered, from the perspective of approaching innovation through in-house research and development, is the high level of adjustment costs. If an organisation establishes an in-house research and development hub as its primary strategy of innovation, it must plan to continue its research and development over a long period, because if the project is abandoned at later stages, it will bring a significant adjustment cost to the organisation's future financial statements. The direct implication of the foregoing for an individual organisation is that it will be much harder for it to procure adequate external capital to support the establishment and operation of any future research and development projects and innovations. This demonstrates the need for organisations that intend to implement in-house innovation strategies to develop plans to ensure the consistency and reliability of cash flow generated from organisational operations to fund, support, and propel research and development projects, which requires the use of accrual-based and real activities earnings management to provide the requisite capital on a continuous basis. This, therefore, may lead executives at innovated firms to be more likely to manipulate earnings.

This researcher proposes the following hypothesis based on innovation according to the above discussion:

This researcher proposes the following hypothesis based on innovation according to the above discussion:

H1: Firms that use innovation strategies have higher levels of earnings management than non-innovated firms.

4.4.2 Innovation Strategy and Accruals Earnings Management

Capital investment is required for the achievement of innovation goals. Innovation requires that firms invest in research and development, which comes with some risk since it requires higher capital and does not come with a guarantee of success. Prior research ([Kothari et al., 2016](#), [Hansen et al., 2009](#)) has looked at earnings management and research and development, and since research and development is discretionary, it can be manipulated ([Guidara and Boujelbene, 2014](#)).

[Walker \(1995\)](#) indicated that for every 100 firms investing in research and development, only one firm successfully delivers its product to the market. When an investment into innovation is being considered, executives have more motivation to manipulate earnings due to the increased risk such an investment can carry. A study by [Osma and Young \(2009\)](#) that examined UK firms between 1989 to 2002 indicated that market pressure for immediate positive earnings has an influence on levels of research and development investments. Another study by ([Mizik, 2010](#)) that examined 6,642 firms indicated that reducing research and development and marketing expenditure had an influence on earnings. Furthermore, [Shust \(2015\)](#) indicated that executives often increased accrual earnings by cutting research and development expenditures. [Baber et al. \(1991\)](#) studied 438 US firms for the period between 1977 and 1987. This study also presented strong evidence that firms often cut research and development expenditures in order to increase earnings. However, [Dechow and Sloan \(1991\)](#) examined the behaviour of research and development expenditures and did not find evidence to support the theory that executives reduce expenditures in order to influence performance.

Similarly, [Bushee \(1998\)](#) investigated the impact of research and development expenditures, finding that executives do not cut research and development to meet earnings targets. Overall, more studies indicated that there was a relationship, though different studies indicated different

signs of such a relationship. [Treacy and Wiersema \(1993\)](#), for example, argued that innovative firms do not have to spend on innovation, as they occupy a unique position in the market. As a result, a decrease in innovation for these firms would be expected.

In contrast, our research held that spending more on innovation is essential to innovated firms, since the adoption of competitive strategies requires continuous funding ([Brown et al., 2009](#)) and borrowing ([Treacy and Wiersema, 1993](#)), and has tax implications ([Smith and Stulz, 1985](#)). Executives might not be comfortable with such unfavourable implications, so in cases in which innovation is essential, they may engage in accrual manipulation in order to mitigate them.

Therefore, as executives increase innovation funding by manipulating accruals in order to meet their firm's expectations, it is fair to conclude that a relationship between innovation and accruals is expected and that signs of innovation are considered to be positive.

This researcher proposes the following hypotheses based on innovation according to the above discussion:

H2: There is a positive relationship between innovation strategy and accrual-based earnings management in firms from developed economies.

H3: There is a positive relationship between innovation strategy and accrual-based earnings management in firms from developing economies.

H4: There is a positive relationship between innovation strategy and accrual-based earnings management in firms from economies in transition.

4.4.3 Innovation Strategy and Real Activities

The work of [Al-Amri et al. \(2017\)](#) provides a different direction, as their study examined firms that reported higher levels of research and development in order to take advantage of tax credits. Their study indicated that executives in these firms engaged in discretionary research and development in order to justify missing earnings. It is fair to say that firms that are facing a troubled year could employ earnings management. Specifically, when they need to claim more expenses in the current year in order to claim fewer expenses in the future. Alternatively, when a firm has a good year there will be more need to incur higher expenses in order that they may claim fewer expenses in the future. Therefore, a negative relationship exists for cases in which executives decrease spending. However, the current study implements a real activities model to measure the impact of real activities on innovation strategy. [Roychowdhury \(2006\)](#) argued that overproduction, sales discounts and lenient credit terms have a negative impact on cash flow, so these kinds of activities have the effect of lowering current cash flow. In other words, overproduction is related to abnormal production manipulation, since overproduction reduces fixed costs by allocating the fixed costs to units of production, thereby reducing unit cost. This reduction in the cost of goods will increase earnings, but since production will be higher than sales, overproduction also has the effect of reducing cash flow. Accelerating sales, which is related to abnormal cash flow, increases earnings by increasing sales through lenient credit terms and discounts, but discount sales and adjustments to payment terms also have a negative impact on cash flow. [Baber et al. \(1991\)](#) argued that executives may decrease spending on innovation in order to report a higher income, while in other situations, they may increase spending on innovations in order to lower reporting earnings. Furthermore, cutting spending in other areas also allows executives to fund innovation.

In light of this discussion, the current study argues that executives in innovated firms that use real activities manipulation are more likely to decrease overproduction and cut other discretionary expenses, such as marketing and advertising. They are also likely to provide fewer discounted sales in order to ensure higher cash flow in the future, as obtaining funds is not an easy task and it increases pressure on executives. In other words, the higher the level of executive manipulation in abnormal discretionary expenses, the more funds will be available for future innovation. Conversely, then, fewer manipulations of abnormal production and abnormal cash flow will increase cash flow availability, which can then be directed toward innovation. Therefore, the more executives engage in real activities (such as abnormal production or abnormal cash flow), the less funds will be available. The expectation for the results of the current study is that signs of abnormal cash flow and abnormal production will be negative and significant, while those for abnormal discretionary expenses will be positive and significant.

This researcher proposes the following hypotheses based on innovation according to the above discussion:

H5: There is a negative relationship between innovation strategy and abnormal production and abnormal cash flow manipulation in firms from developed economies.

H6: There is a negative relationship between innovation strategy and abnormal production and abnormal cash flow manipulation in firms from developing economies.

H7: There is a negative relationship between innovation strategy and abnormal production and abnormal cash flow manipulation in firms from economies in transition.

H8: There is a positive relationship between innovation strategy and abnormal discretionary expenses manipulation in firms from developed economies.

H9: There is a positive relationship between innovation strategy and abnormal discretionary expenses manipulation in firms from developing economies.

H10: There is a positive relationship between innovation strategy and abnormal discretionary expenses manipulation in firms from economies in transition.

4.4.4 Innovation Strategy and Accruals vs Real Activities

Using a survey and interviews, [Graham et al. \(2005\)](#) indicated that after the Sarbanes–Oxley Act of 2002, executives appeared to shift earnings management from accruals management to real activities management. Furthermore, this change may have resulted in changes in accounting standards. Similarly, [Cohen et al. \(2008\)](#) provided evidence supporting [Graham et al. \(2005\)](#) finding that executives have shifted their manipulation from accruals to real activities. As a result of this research, ([Roychowdhury, 2006](#)) formulated a real activities model to examine the earnings management behaviour of executives. Since Roychowdhury's 2006 work, a number of studies have examined real activities manipulation; however, up to now, accruals studies have dominated the literature.

[Zang \(2007\)](#) examined whether executives choose real activities manipulation over accruals manipulation. This paper revealed that executives used both models to achieve their goals. Prior researchers have tended to deduct earnings from their studies, opting instead to use accruals or real activities; therefore, the timing of the manipulation can be considered an essential factor in researchers' understanding of the behaviour of executives ([Wiedman, 2009](#)). Since manipulation happens through accrual, accounting choices can be made prior to the release of financial reports, while real activities manipulation requires prior knowledge and must happen during a particular period. In other words, executives can commit accrual manipulation after the year end, while real activities manipulation cannot be happen after the year end ([Zang, 2011](#)). Executives will not, however, generally engage in manipulating financial statements if they can meet their incentives without managing earnings, and therefore, it should be ensured that executives have ample information regarding earnings toward the end of the year. [Jackson and Wilcox \(2000\)](#) indicated that sales discount increases in the last quarter, compared to those that are implemented at the beginning of the year, increase purchases that will aid in the achievement of executives' incentives. Along the same

lines, [Barua et al. \(2010\)](#) provided empirical evidence that executives will often shift earnings management by shifting expenses to particular items in the last quarter. [Shon and Yan \(2015\)](#) examined firms' research and development and achieving earnings benchmarks, finding that firms tend to reduce research and development in the last quarter compared to the beginning of the year. Furthermore, real activities manipulation has an effect on the upcoming periods, and as a result, executives will use these approaches at different times during the year. Since real activities management requires prior preparation, it is fair to say that executives tend to manipulate accruals more often than real activities. Furthermore, executives may miss opportunities to engage in real activities manipulation during the year, due to some of the economic and business changes that may occur, which may lead them to turn to methods which allow them to manipulate their year-end financial reports.

This researcher proposes the following hypotheses based on earnings management models and research and development according to the above discussion:

H11: Firms focused on innovation strategy are more likely to engage in earning management by utilising accruals methods in developed economies.

H12: Firms focused on innovation strategy are more likely to engage in earning management by utilising accruals methods in developing economies.

H13: Firms focused on innovation strategy are more likely to engage in earning management by utilising accruals methods in economies in transition.

<i>Innovative Firms vs Innovated Firms and Earnings Management</i>	–H1: firms with innovation strategy have higher earnings management than non-innovated firms.	Prior research, (Roychowdhury, 2006) (Cohen and Zarowin, 2010) (Jones, 1991, Jeppson and Nathan)	
<i>Innovation Strategy and Accruals Earnings Management</i>	–H2: There is a positive relationship between innovation strategy and accruals earnings management in developed economy firms.	–H3: There is a positive relationship between innovation strategy and accruals earnings management in developing economy firms.	–H4: There is a positive relationship between innovation strategy accruals and earnings management level in transition economy firms.
	(Mizik, 2010) ; (Osma and Young) , (Mizik) , (Bushee, 1998)		
<i>Innovation Strategy and Real Activities</i>	–H5: There is a negative relationship between innovation strategy and abnormal production, abnormal cash flow manipulation in developed economy firms.	–H6: There is a negative relationship between innovation strategy and abnormal production, abnormal cash flow manipulation in developing economy firms.	H7: There is a negative relationship between innovation strategy and abnormal production, abnormal cash flow manipulation in transition economy firms.
	Prior research, Roychowdhury, 2006 (Thomas and Zhang) , (Baber et al., 1991) , (Graham et al.) , (Zang) , (Barua et al., 2010)		
<i>Innovation Strategy and Real Activities</i>	–H8: There is a positives relationship between innovation strategy and abnormal discretionary expenses manipulation in developed economy firms.	–H9: There is a positives relationship between innovation strategy and abnormal discretionary expenses manipulation in developing economy firms.	–H10: There is a positives relationship between innovation strategy and abnormal discretionary expenses manipulation in transition economy firms.
	Prior (Thomas and Zhang) , (Baber et al., 1991) , (Graham et al.) , (Zang) , (Barua et al., 2010)		
<i>Innovation Strategy and Real Activities</i>	–H11: Firms focused on innovation strategy in are more likely to engage in earning management by utilising accruals methods in developed economies.	–H12: Firms focused on innovation strategy in are more likely to engage in earning management by utilising accruals methods in developing economies	–H13: Firms focused on innovation strategy in are more likely to engage in earning management by utilising accruals methods in transition economies
	Prior research, (Omonuk) (Lev and Sougiannis) , (Leone and Rock) . (Graham et al.) , (Zang) , (Barua et al., 2010) Roychowdhury, 2006		

TABLE 3.3. Summary of the hypotheses supported by references

4.5 Sample and Data

In consideration of this PhD, the researcher selected firms in 96 countries from 1995 to 2018. There were missing values from OSIRIS Database and System for Electronic Document Analysis and Retrieval (SEDAR) for North America regarding our models' variables. All missing values were excluded from the research, which decreased the observation years from 1995 -2018 to 2010- 2018. In addition, following [Roychowdhury \(2006\)](#), firms with regulated industries (*SIC codes 4400-4999*) and banks and financial institutions (*SIC codes 6000- 6499*) were not included in this sample as [Matsumoto \(2002\)](#) indicated these firms, compared to industry, have different incentives. All models utilised in this research run time series for a year.

Furthermore, similar to ([Peasnell et al., 2000](#)), a minimum of seven observations is required for each industry observation; Also, firms lacking complete accounting data needed for the empirical analysis are excluded. According to the Global Industry Classification Standard, the global sector consists of 11 types reported in chart. After removing financial and banks institution as well as real estate, utilities and communication services, this PhD examined seven types of sectors having a total of 36,777 firms.

FIGURE 4.1. Global Industry Classification

10 Energy	20 Industrials	25 Consumer Discretionary	30 Consumer Staples	35 Health Care
1010 Energy 101010 Energy Equipment & Services 10101010 Oil & Gas Drilling 10101020 Oil & Gas Equipment & Services 101020 Oil, Gas & Consumable Fuels 10102010 Integrated Oil & Gas 10102020 Oil & Gas Exploration & Production 10102030 Oil & Gas Refining & Marketing 10102040 Oil & Gas Storage & Transportation 10102050 Coal & Consumable Fuels	2010 Capital Goods 201010 Aerospace & Defense 20101010 Aerospace & Defense 201020 Building Products 20102010 Building Products 201030 Construction & Engineering 20103010 Construction & Engineering 201040 Electrical Equipment 20104010 Electrical Components & Equipment 20104020 Heavy Electrical Equipment 201050 Industrial Conglomerates 20105010 Industrial Conglomerates 201060 Machinery 20106010 Construction Machinery & Heavy Trucks 20106015 Agricultural & Farm Machinery 20106020 Industrial Machinery 201070 Trading Companies & Distributors 20107010 Trading Companies & Distributors 2020 Commercial & Professional Services 202010 Commercial Services & Supplies 20201010 Commercial Printing 20201050 Environmental & Facilities Services 20201060 Office Services & Supplies 20201070 Diversified Support Services 20201080 Security & Alarm Services 202020 Professional Services 20202010 Human Resource & Employment Services 20202020 Research & Consulting Services 2030 Transportation 203010 Air Freight & Logistics 20301010 Air Freight & Logistics 203020 Airlines 20302010 Airlines 203030 Marine 20303010 Marine 203040 Road & Rail 20304010 Railroads 20304020 Trucking 203050 Transportation Infrastructure 20305010 Airport Services 20305020 Highways & Railroads 20305030 Marine Ports & Services	2510 Automobiles & Components 251010 Auto Components 25101010 Auto Parts & Equipment 25101020 Tires & Rubber 251020 Automobiles 25102010 Automobile Manufacturers 25102020 Motorcycle Manufacturers 2520 Consumer Durables & Apparel 252010 Household Durables 25201010 Consumer Electronics 25201020 Home Furnishings 25201030 Homebuilding 25201040 Household Appliances 25201050 Housewares & Specialties 252020 Leisure Products 25202010 Leisure Products 252030 Textiles, Apparel & Luxury Goods 25203010 Apparel, Accessories & Luxury Goods 25203020 Footwear 25203030 Textiles 2530 Consumer Services 253010 Hotels, Restaurants & Leisure 25301010 Casinos & Gaming 25301020 Hotels, Resorts & Cruise Lines 25301030 Leisure Facilities 25301040 Restaurants 253020 Diversified Consumer Services 25302010 Education Services 25302020 Specialized Consumer Services 2550 Retailing 255010 Distributors 25501010 Distributors 255020 Internet & Direct Marketing Retail 25502020 Internet & Direct Marketing Retail 255030 Multiline Retail 25503010 Department Stores 25503020 General Merchandise Stores 255040 Specialty Retail 25504010 Apparel Retail 25504020 Computer & Electronics Retail 25504030 Home Improvement Retail 25504040 Specialty Stores 25504050 Automotive Retail 25504060 Homefurnishing Retail	3010 Food & Staples Retailing 301010 Food & Staples Retailing 30101010 Drug Retail 30101020 Food Distributors 30101030 Food Retail 30101040 Hypermarkets & Super Centers 3020 Food, Beverage & Tobacco 302010 Beverages 30201010 Brewers 30201020 Distillers & Vintners 30201030 Soft Drinks 302020 Food Products 30202010 Agricultural Products 30202030 Packaged Foods & Meats 302030 Tobacco 30203010 Tobacco 3030 Household & Personal Products 303010 Household Products 30301010 Household Products 303020 Personal Products 30302010 Personal Products	3510 Health Care Equipment & Services 351010 Health Care Equipment & Supplies 35101010 Health Care Equipment 35101020 Health Care Supplies 351020 Health Care Providers & Services 35102010 Health Care Distributors 35102015 Health Care Services 35102020 Health Care Facilities 35102030 Managed Health Care 351030 Health Care Technology 35103010 Health Care Technology 3520 Pharmaceuticals, Biotechnology & Life Sciences 352010 Biotechnology 35201010 Biotechnology 352020 Pharmaceuticals 35202010 Pharmaceuticals 352030 Life Sciences Tools & Services 35203010 Life Sciences Tools & Services 45 Information Technology 4510 Software & Services 451020 IT Services 45102010 IT Consulting & Other Services 45102020 Data Processing & Outsourced Services 45102030 Internet Services & Infrastructure 451030 Software 45103010 Application Software 45103020 Systems Software 4520 Technology Hardware & Equipment 452010 Communications Equipment 45201020 Communications Equipment 452020 Technology Hardware, Storage & Peripherals 45202030 Technology Hardware, Storage & Peripherals 452030 Electronic Equipment, Instruments & Components 45203010 Electronic Equipment & Instruments 45203015 Electronic Components 45203020 Electronic Manufacturing Services 45203030 Technology Distributors 4530 Semiconductors & Semiconductor Equipment 453010 Semiconductors & Semiconductor Equipment 45301010 Semiconductor Equipment 45301020 Semiconductors

4.5.1 Control Variables

Consistent with prior studies, this research employed several independent variables to test hypotheses. Prior studies, such as [Dechow et al. \(1995\)](#), [ALGHAMDI and Ali \(2012\)](#) demonstrated the importance of specific control variables, such as cash flow from operating, and return on investment. This research utilises four control variables to proxy for innovation strategy, cash flow, leverage growth, performance, size and industry. To test the hypotheses, the researcher calculated the number of variables

4.5.1.1 Firm size:

For the firm size, the researcher calculated the natural logarithmic form of the firm's total assets. [Erickson and Wang \(1999\)](#) indicated that the firm size increases earnings management positively. Also, ([Roychowdhury, 2006](#)) presented evidence on the relationship between firm size and real earnings management. The firm size was included in variables to assess the relationship between accruals earnings and real activities earnings and firm size. According to [Watts and Zimmerman \(1986\)](#), earnings management is associated with the firm size: the larger the firm, the more likely the manager will select accounting procedures that shift earnings to different periods. Also, [Lee and Choi \(2002\)](#) evidenced that insignificant firms tend to manage earnings. In contrast, [Gu et al. \(2005\)](#), [Benkel et al. \(2006\)](#) indicated that the larger the firm, the less the executives engaged in earnings management. As presented and pointed out in many prior pieces of research, such as [Park and Shin \(2004\)](#), [Ebrahim \(2007\)](#), [Jaggi and Leung \(2007\)](#), there is a significant negative relationship between firm size and management earnings. Some research treated number of employees as a variable to test for firm size. The main weakness with this is that they have treated some industries, such as technology, the same as manufactures. The researcher points out in this PhD that the number

of employees in industries, such as technology does not necessarily show the size of firms. Some technology's firms have fewer employees, but they are significant in the capital.

[Zhou \(2008\)](#) documented that the impact of size on earnings management can be either negative or positive. For instance, a larger firm may or may not have the incentive to manipulate the financial reports depending on whether they are being monitored by being external observers. Therefore, the researcher does not predict the direction of the impact of firms' size on earnings management, as larger firms tend to spend more on innovation and have higher earnings management and small business spend less and could have fewer earnings management.

4.5.1.2 Firm Performance

This is calculated as a dummy variable that takes '1' if the firm has negative income and '0' otherwise. [Hirao and Hoshino \(2015\)](#) provided a framework that provides evidence on the relationship between research and development and profitability. Similarly, [\(Griliches, 1987\)](#) presented evidence on the level of research and development in USA firms and profitability. Also, [VanderPal \(2015\)](#) presented strong evidence on the relationship between research and development and firm performance, which resulted in an increase in productivities. This research measures firm profitability as net income before research and development divided by the lag assets and employs the hypotheses. [Teoh et al. \(1998\)](#) indicated that earnings management exists when firms raise capital. Also, many prior pieces of research documented evidence on the relationship between earnings management and performance, such as [Park and Shin \(2004\)](#), [Davidson et al. \(2005\)](#). According to [Qamar et al. \(2015\)](#) one of the most critical indicators of the prediction of future cash flow is earnings quality. The higher the earnings quality, the more accurate the prediction is. [McNichols \(2000\)](#) indicated that firm performance is affected by accruals models positively. [Dechow et al. \(2010\)](#) also indicated the possibility of the existence of earnings management and its impact on firm performance. [Ehie](#)

[and Olibe \(2010\)](#) found a strong positive relationship between innovation and firms' performance in examining 2,500 US firms over an 18-year period. The research assumed a positive relationship as high earnings management would result in a higher return. [Francis and Wang \(2008\)](#) documented that firms with positive income are not motivated in the manipulation of the financial reports, but firms with negative income are motivated. Therefore, this PhD predicts a positive sign between earnings management and negative income.

4.5.1.3 Research and Development

Following prior research, the researcher calculated research and development expenditure by lag assets. Although it is known that research and development expenditure is likely to create future benefit for firms once it capitalises, it must still meet specific criteria. Prior research, such as. ([Chaney et al.](#)), ([Osma and Young](#)), ([Mizik](#)) and ([Jeppson and Nathan](#)), investigated the relationship between research and development and earnings management from different perspectives. Other studies examined research and development such as ([Zarowin and Oswald](#)) examined the decision of capitalising the research and development vs expenses the cost. The study found shreds of evidence that executives reduce research and development to meet the earnings and avoid losses in the UK. ([Markarian et al.](#)) examined the decision of capitalising the research and development expenditure in Italian firms. The study documented that Italian firms tend to capitalised research and development to reduce covenants risks.

4.5.1.4 Firm growth

The researcher calculated the firm growth by taking the difference between the current and the prior year's total assets divided by the prior year's total assets. McNichols ([McNichols](#)) argued that there is a positive relationship between accruals models and firm growth. ([Abarbanell and Lehavy, 2003](#)) pointed out the positive impact of earnings management and firm growth while [Dechow et al. \(2010\)](#) argued that there is a possibility between earnings management and firm growth. Also, [Radhakrishnan et al. \(2017\)](#) examined the impact of innovation on firms'

growth. The founding consistency with prior research which pointed out the positive relationship between innovation and firm's growth. On the other hand, numerous researchers such as [Becker et al. \(1998\)](#) [Matsumoto \(2002\)](#) have documented a positive relationship between earnings management and firm growth. Therefore, this research predicts a positive relationship between earnings management and firm growth.

4.5.1.5 Cash flow

The researcher calculated the cash flow from operating divided by current liabilities, following prior studies ([Dechow et al., 1998](#), [Graham et al., 2005](#)) which linked earnings management with cash flow. [Frankel et al. \(2002\)](#) argued that higher is linked directly to higher firm performance. [Dechow et al. \(1998\)](#) ([Francis and Wang, 2008](#)) argued that there is a negative relationship between operating cash flow and earnings management. On the other hand, innovated firms are more likely to have lower cash flow as they fund the research and development. Executives could use the cash available in the current year for a possible investment decision. [Sasaki \(2017\)](#) indicated that firms with better cash managing have healthier research and development funds. Therefore, we predict the sign to be negative.

4.5.1.6 Financial Leverage

Calculated as net income scaled by firm debt. Prior studies have utilised financial leverage to determine the firm's debt structure. According to [Chih et al. \(2008\)](#) firms that are motivated to engage in earnings manipulation have a higher debt ratio. Similarly, [Watts and Zimmerman \(1990\)](#) found that executives tend to manage earnings upward to avoid violation of covenant. Others, such as [Vakilifard and Mortazavi \(2016\)](#), have studied the impact of financial leverage on earnings management. The results were consistent with previous papers, as firms with high debt covenant are more motivated to implement decisions to increase the total accruals. [Hall \(1989\)](#) indicated that the firms that engaged in innovation tend to have higher debt than non-

innovated firms, as innovation requires additional funding and executives may increase the debt in order to fund innovation; therefore, this research predicated a negative sign.

4.5.1.7 Industrial dummy:

prior studies such as ([Kouaib and Jarboui, 2014](#), [McClelland et al., 2012](#)) have indicated that earnings management can vary from industry to industry, based on that this PhD included a control variable to moderate any industry impact.

TABLE 4.1. Variable definitions

Group	Variable	Code	Measurement
Dependent variables	Innovations	INNV	This variable was measured by using research and development in the current year divided by lagged assets.
	Discretionary accruals	M1	This variable was measured by using standard prediction errors from the Standard Jones Model . Using balance sheet approach .
Independent variables	Discretionary accruals	M2	This variable was measured by using standard prediction errors from the Modified Jones Model . Using balance sheet approach .
	Discretionary accruals	M3	This variable was measured by using standard prediction errors from the Kothari Model . Using balance sheet approach .
	Discretionary accruals	M4	This variable was measured by using standard prediction errors from the Standard Jones Model . Using cash flow approach .
	Discretionary accruals	M5	This variable was measured by using standard prediction errors from the Modified Jones Model . Using cash flow approach .
Independent variables	Discretionary accruals	M6	This variable was measured by using standard prediction errors from the Kothari Model . Using cash flow approach .
	Abnormal cash flow	R1	This variable was measured by using standard prediction abnormal cash flow from the Roychowdhury Model.
	Abnormal production	R2	This variable was measured by using standard prediction abnormal production from the Roychowdhury Model.
	Abnormal discretionary expenses.	R3	This variable was measured by using standard prediction abnormal discretionary expenses flow from the Roychowdhury Model

TABLE 4.1. Variable definitions continues

Group	Variable	Code	Measurement
Control variables	Firm Growth	GRO	difference between the current and the prior year's total assets divided by the prior year's total assets.
	Firm Size	Size	the natural logarithmic form of the firm's total assets.
	Financial leverage	LEV	net income less preferred dividends scaled by average outstanding common shares
	Performance	PERF	dummy variable that takes '1' if the firm has negative income and '0'
	Cash Flow	CFO_A	the cash flow from operating divided by current liabilities
	Industrial	IND	Dummy variables

4.6 Chapter Summary

In this chapter, the researcher examined the overview of the research philosophy position in social sciences. A deductive approach, which is linked to the positivist paradigm, is adopted in this PhD research. From three strategy methods, quantitative, qualitative and mixed, a quantitative method was employed since executives responds were below the requirement. In addition, the chapter demonstrates the adoption of control variables employed by prior researches: firm size, cash flow, firm performance, firm growth, firm financial leverage, firm innovation, and industrial. Also, this chapter demonstrates the data sampling and the data excluded from the research as they have different financial reporting. Finally, according to prior research, there is a relationship between earnings management and innovations strategies. Since earnings management has two methods, accruals and real activities, the study explored the relationship between accruals and earnings management and predicted a positive relationship, as the reduction of accruals is a reason to support innovation. The study predicted a positive relationship between real manipulation in discretionary expenses and innovation as the manipulation of discretionary expenses would reduce the expenditure, which can be utilised in supporting innovation. Also, this PhD predicted a negative relationship between production and cash flow manipulations since the higher of the managing these accounts, the less cash flow available to support innovation. Lastly, we predicted that innovated firms utilise accruals manipulation more than real activities manipulations. Put it differently, accruals accounts have no direct impact on cash flow, but real activities do. Innovation requires funds, and accruals can generate higher net income which can be used to support innovation. Therefore, accruals are preferred by executives firms with innovation strategies.

5. Chapter Five : Empirical findings

5.1 Introduction

This chapter provides the results of the analysis of the impact of earnings management on innovation strategies in developed, developing and transition economies. As stated in previous chapters, five earnings management models are employed, the standard Jones model, modified Jones model, Kothari model and the Roychowdhury models. As dependent variables, discretionary accruals were employed for standard Jones, modified Jones and Kothari under both approaches and balance sheet and cash flow. In addition, the descriptive statistic was employed to find the mean, median and standard deviations for each economy. The correlation matrix was used to assess the relationship between dependent and independent variables. Finally, the test of regression assumption as well test of hypotheses.

5.2 Measuring Accruals Models and Abnormal Activities

I begin my empirical analysis by examining earnings management models. The choice of focusing on specific models as standard jones and modified jones are the most popular models among researchers. Working capital model and performance model are getting more intention as they claimed to provide better results than standard jones and modified jones. Lastly, since executives are shifting their focus from accruals manipulations to real operations manipulation, the study employed real activities model. Thereby, for this analysis, I focus on identifying which model is more potent in deducting earnings management in each economy, and for which I can evaluate each model independently.

The results of the analysis as to whether the regression models result in a statistically significantly better prediction of the dependent variables, mean coefficient (t-statistics) are summarised in Table 5.1. The test indicates that all of the earnings management models are statistically highly significant as the $P < 0.001$ with no exemption Also, it provides empirical

evidence as to whether the earnings management models have high or low R2 and which model is more potent in deducting earnings management. As specified before, there are two methods employed in calculating total accruals in order to predict earnings management. For full sample results, R2 provided the highest R2 (.96) followed by M6 (.62). Balance sheet approach has a higher R2 compared to the cash flow approach in the exemption to the M6 model. WCM provided higher R2 than cash flow approach but lower than balance sheet approach

TABLE 5.1. Summary of the model fit.

Earnings Management Model	Non-Innovated	Innovated	full sample
M2	0.1	0.48	0.25
M5	0.11	0.28	0.14
M1	0.16	0.48	0.28
M4	0.12	0.28	0.15
M6	0.69	0.47	0.62
M3	0.26	0.49	0.3
WCM	0.45	0.29	0.2
R1	0.47	0.43	0.43
R3	0.09	0.02	0.08
R2	0.89	0.96	0.93

In term of innovated firms, s presented in table 5.1. and figure 5.1. R2 still provided the highest R2, followed by accruals models under the balance sheet approach. Equally, WCM has higher R2 than accruals models under cash flow but lower under balance sheet approach. R3 provided the lowest R2 under all sample as well as under innovated firms.

SJBS (.48) F-statistic (14741.94), BSMJ (.48) F-statistic (14528.24), KOHBS (.49) F-statistic (11276.32), On the other hand, R2s results for cash flow are lower CFSJ (.28) F-statistic (6137.34) and CFMJ (.28) F-statistic (6057.33), CFKOH (.47) F-statistic (10432.50). The working capital model has higher R2 compared to modified jones cash flow approach, as R2

results (.29) and F-statistic (7110.24). ABN_PRO reported (.96) followed by ABN_CFO (.43), while ABN_DIXP (0.02).

FIGURE 5.1. Accruals model fit.

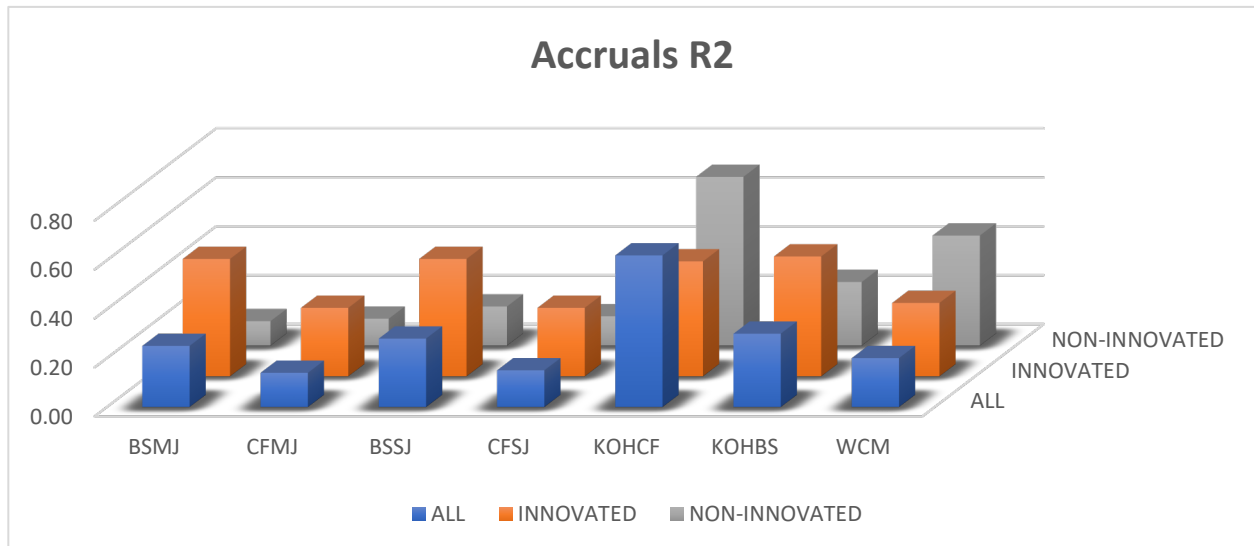
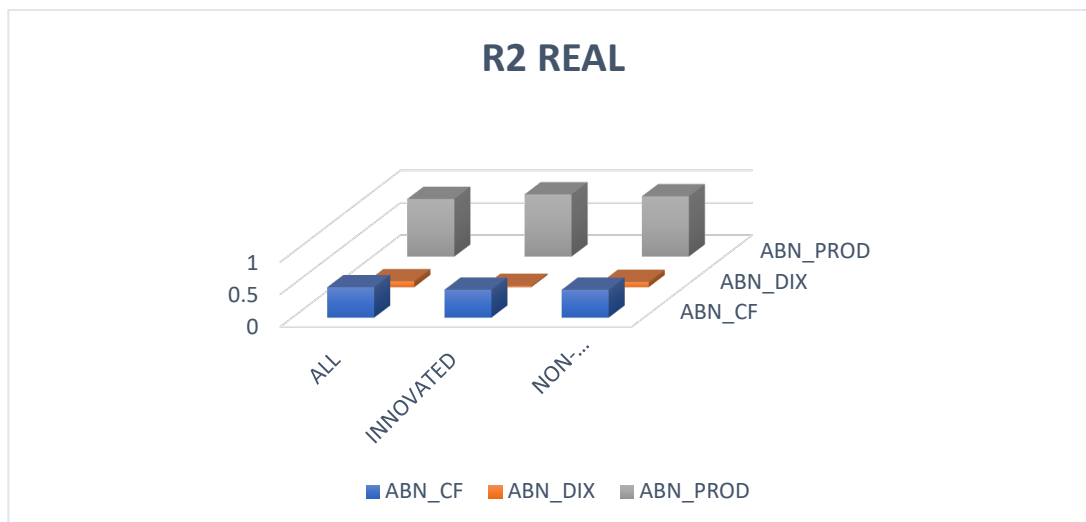


FIGURE 5.2. Real Activities models fit.



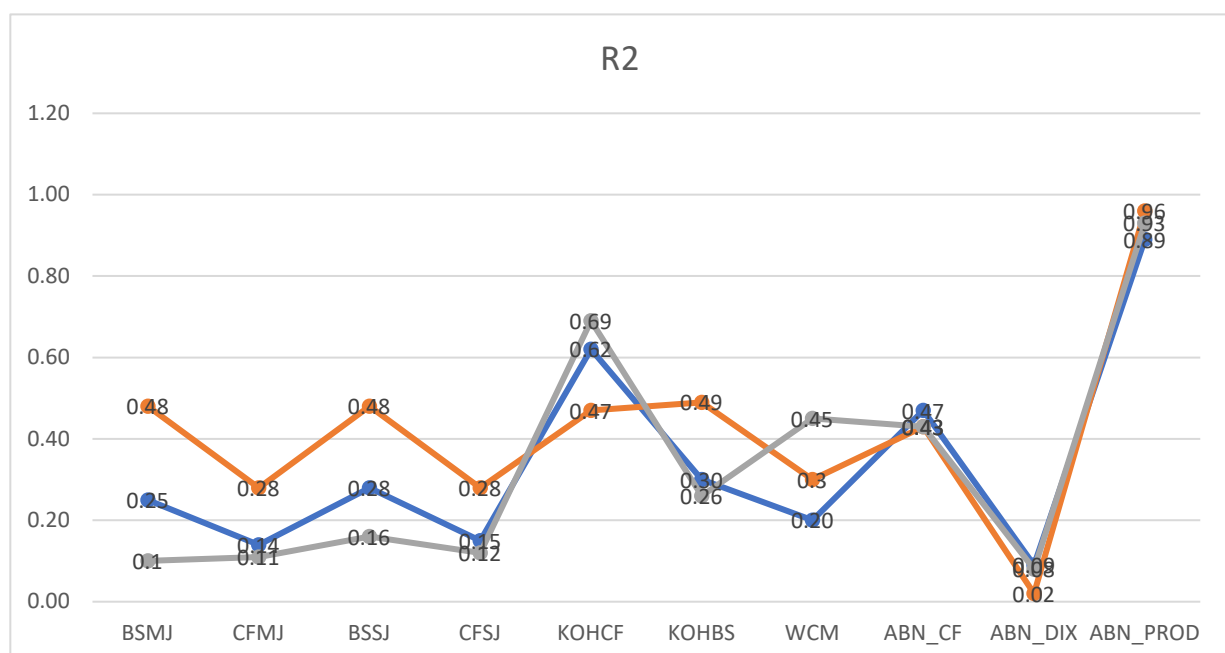
As the results show, the estimated coefficients in all models for independent variables are significant at 1% which were to some degree similar to ([Roychowdhury, 2006](#)), as he reported

higher abnormal production (.89), abnormal discretionary expenses (.45) and abnormal cash flow (.28)

The arguments in the prior chapters suggest that WCM is more potent than Modified Jones and Standard Jones. The pieces of evidence in this section suggest otherwise. These results suggest that concerning the whole sample, innovated firms, and non-innovated firms, as presented in table 5.1, figures 5.1, and figures 5.2, the accruals models, ([Kothari et al.](#)) model is proven to be more superior than the other accruals models. The WCM has higher R2 than Modified Jones and Standard Jones cash flow approach but lowers compared to the balance sheet approach.

Also, the prior studies indicate that Standard Jones is not well in deducting manipulations as Modified Jones, this paper proven that both approaches are to some degree identical, and it is not much different. In addition, the balance sheet approach provided higher R2 than cash flow approach.

FIGURE 5.3. All samples fit.



Many researchers such as ([Thomas and Zhang, 2002](#), [Collins et al., 1999](#)) have computed total accruals using cash flow approach. Our results are not consistent with these studies; for example, according to [Bešlić et al. \(2015\)](#), the cash flow approach is considered more effective in finding total accruals. We argue that previous studies that calculated total accruals using cash flow have not taken into consideration some critical differences between cash flow and balance sheet. The reason for the difference in our finding and other studies likely is that cash flow has items such as non-operating gain and losses, which are not included in the balance sheet. Also, the changes in equity items impact the income statements rather than the balance sheet. Finally, [Hribar and Collins \(2002\)](#) stated one major drawback of the balance sheet approach in that balance sheet results could be misleading. Therefore, these results need to be interpreted with caution, based on the above results, the main differences described earlier is driven by both approaches, which result from mixed outcomes in accruals models due to the weaknesses in calculating the accruals.

In summary, Kothari model is more powerful in explaining the difference in accruals as the model reported the highest R² among all accruals. Kothari attempt to enhance accruals models by controlling the effect of firm performance. Nevertheless, the model cannot solve the issue with accruals calculation, and the result might be misleading since Kothari model under cash flow approach provides a different result.

In term of WCM, the higher R² if we consider the cash flow in calculating the accruals; This explains the reason of why some of the researchers such as ([Almasarwah, 2015](#), [Peasnell et al., 2000](#)) considered WCM is more potent than another accruals model. However, this PhD result has proven that the Peasnell model might not be more potent in deducting earnings management. Another explanation might be that prior researchers have not only use cash flow approach, but miscalculation of WCM as ([Almasarwah, 2015](#)) omitted some variables in

calculating WCM as it was not available in his data samples, which produce biased result toward WCM.

As presented in table 5.2, in term of the coefficients, the change in revenue in the models were positives and highly significant. This result was directly compared with the previously reported in the original study standard jones by Jennifer Jones. The result was identical since jones model reported a positive change in revenues. In term of the coefficients ($\Delta REV_ \Delta AR$) were positives. A similar pattern of results was obtained on modified Jones. This result was directly compared with the previously reported findings by ([Dechow et al., 1998](#)) and the signs of all positives were identical. The change in revenue is linked positively to the executives' income increase manipulations, which is consistent with the assumption of the increase in working capital, which results in an increase in revenue. As a result, the changes in revenue are positive as with executives' income increase manipulation; Also, a negative PPE is related to income decrease, which is consistent with ([Watts and Zimmerman, 1990](#)) theory. Also, the negative PPE result was identical in Kothari model, and it is related to the significant depreciation.

TABLE 5.2. Coefficient (t-statistic) for Earnings Management Models, Accruals Models.

	M1	M2	M3	M4	M5	M6
term1	1739.9*** -24.43	1933.6*** -26.56	1709.8*** -24.34	1278.5*** -37	1320.4*** -38.01	1016.3*** -44.52
term2	0.0854*** -126.69			0.0217*** -66.44		
term3	-0.371*** (-233.80)	-0.346*** (-211.75)	-0.461*** (-237.34)	0.0438*** -56.85	0.0492*** -63.13	-0.107*** (-169.54)
term2		0.0766*** -97.24	0.0551*** -69.87		0.0203*** -54.06	0.00888*** (-34.65)
term4			0.580*** -101.26			0.788*** -423.38

=** p<0.05 ** p<0.01 *** p<0.001

As demonstrated in table 5.3, real activities model as expected, all of the coefficient is identical with few exemptions. Specifically, in ABN_CFO, and ABN_PRO models, the change in sales scaled by the lag assets reported in ([Roychowdhury, 2006](#)) positive, but our result is negative. Roychowdhury assumed that the higher sales would result in higher cash flow in the coefficient, but this may not be the case as higher sales may not result in higher cash flow from sales. In ABN_DIX, the sales coefficients were negative; this could be the change in expenses may not have a direct impact on the sales. Nevertheless, in adjusted DIXP, the coefficient of sale become positive as Roychowdhury model, which explain that the research in development items has an impact on sales rather than other expenses. A different explanation of the difference in coefficient could be a result of the difference in the market. Also, in the WCM coefficients, the total sales variables have a positive sign, and total sales minus the change in trade debtor's variable have a negative sign. These results are consistent with the original study in the margin model by ([Peasnell et al., 2000](#)) .

TABLE 5.3. Coefficient (t-statistic) for Earnings Management, Real Activities Models

	R1	R3_ADJ	R2	R3
R1_term1	-519.0*** (-16.95)			
R1_term2	0.0517*** -26.25			
R1_term3	-0.00687*** (-3.50)			
R3_term1		3885.0*** -48.38		14945.2*** -109.26
R3_term2		0.0360*** -6.94		-0.0493*** (-5.58)
R2_term1			-618.8*** (-5.63)	
R2_term2			0.840*** -182	
R2_term3			-0.00226 (-0.49)	
R2_term4			-0.0108*** (-12.27)	

="* p<0.05 ** p<0.01 *** p<0.001"

5.3 Descriptive Statistics and Univariate Analysis

In this section, the researcher provides descriptive statistics and univariate analysis results of the dependent and independent variables utilised in this research. As stated previously, the dependent variables are earnings management models, using standard Jones and modified Jones Kothari under both approaches of cash flow and balance sheet approach, working capital model, and real activities models. For variables, these are firm size, cash flow, firm performance, firm growth, financial leverage, innovation, and industrial.

5.4 Dependent Variable (Earnings Management)

5.5 Earnings Management Variable

This section provides a complete review of all descriptive analysis and correlations of the variables utilised in this PhD. The researcher's primary goal is to provide a clear picture of the quantitative characteristics of utilised in this PhD. The researcher discusses the most critical statistics, including, mean, median. The standard deviation for all of the variables based on total firms (N 36,777), developed economy (N 5,065) as 49% is for non-innovated firms and 50% for innovated firms, developing economy (N8,441) as 75% for non-innovated firms and 25% is for innovated firms and economy in transition (N 100) as 89% for non-innovated firms and 11% for innovated firms. Each economy is compared to one another and the whole data as well. Also, pairwise correlations are utilised to provide information on the relationship between the variables. The existence of a strong relationship between two model variables indicates signs of multicollinearity, which will be examined in the regression test assumptions section.

TABLE 5.4. descriptive statistic to all sample, developed, developing, and transition economies.

	R1	R3	R2	WCM	M2	M5	M1	M4	M6	M3
Mean	0.02	0.49	-0.14	0.29	0.11	0	0.09	0	0.08	-0.03
Median	-0.01	0.06	-0.1	0.16	0.05	0	0.06	0.01	0.03	-0.02
Std. D.	2.87	7.76	7.48	7.67	8.66	3.81	8.35	3.78	8.34	2.57
Mean	0.02	0.31	-0.1	0.37	0.07	-0.02	0.07	-0.02	0.06	-0.03
Median	-0.01	0.05	-0.08	0.17	0.05	0	0.05	0	0.03	-0.02
Std. D.	1.31	6.04	3.86	8.18	3.86	2.22	3.94	2.21	3.74	1.38
Mean	0.04	0.11	0	0.71	0.05	-0.01	0.06	-0.01	0	-0.09
Median	-0.01	0.05	-0.12	0.18	0.03	0.01	0.04	0.01	0.01	-0.02
Std. D.	0.88	3.37	4.25	6.09	2.5	1.82	2.56	1.81	3.22	1.15
Mean	0.02	0.37	-0.11	0.34	0.08	-0.01	0.08	-0.01	0.07	-0.03
Median	-0.01	0.06	-0.09	0.16	0.05	0	0.06	0	0.03	-0.02
Std. D.	2.03	6.72	5.51	7.98	6.1	2.91	5.97	2.9	5.88	1.91

As presented in Table 5.4, figures 5.4 and 5.5, the finding is consistent with the findings in the previous literature on the earnings management existences. The mean values and the median values for all of the earnings management models are around zero, including the second analysis for non-innovation and innovated firms; This indicates that all models with no exemptions are well fit this data. This observation supports ([Hayes and Cai, 2007](#)), who found that the most suitable regression model was the one where the mean was around zero. It is also consistent with prior studies which were similar to the issues investigated in this study ([Klein, 2002](#), [Almasarwah, 2015](#)), [Roychowdhury \(2006\)](#). [Al-Shattarat \(2017\)](#) examined the impact of earnings management on firm performance. The study examined UK firms from 2009 through 2013 and reported mean values for real activities and accruals model around zero. Others have shown similarity, such as [Bhuiyan et al. \(2013\)](#) who examined 70 firms for the period between 2000-2007 in New Zealand, which also reported mean values around zero.

On the other hand, [Arifin and Kusuma \(2011\)](#) reported mean value for modified Jones around (1.0); the difference may that, in their study, they used fewer country observations, Germany and the United States, and different of years observation, 2004 to 2007. Also, ([Klein, 2002](#)), in the US, found the mean values to be zero in four earnings models. Since the median values are around zeros, this suggests the earnings management models are free from outliers. The standard deviation is higher than other studies as higher standard deviation indicates higher earnings management ([Ferramosca and Allegrini, 2018](#)).

FIGURE 5.4. Mean values for all sample.

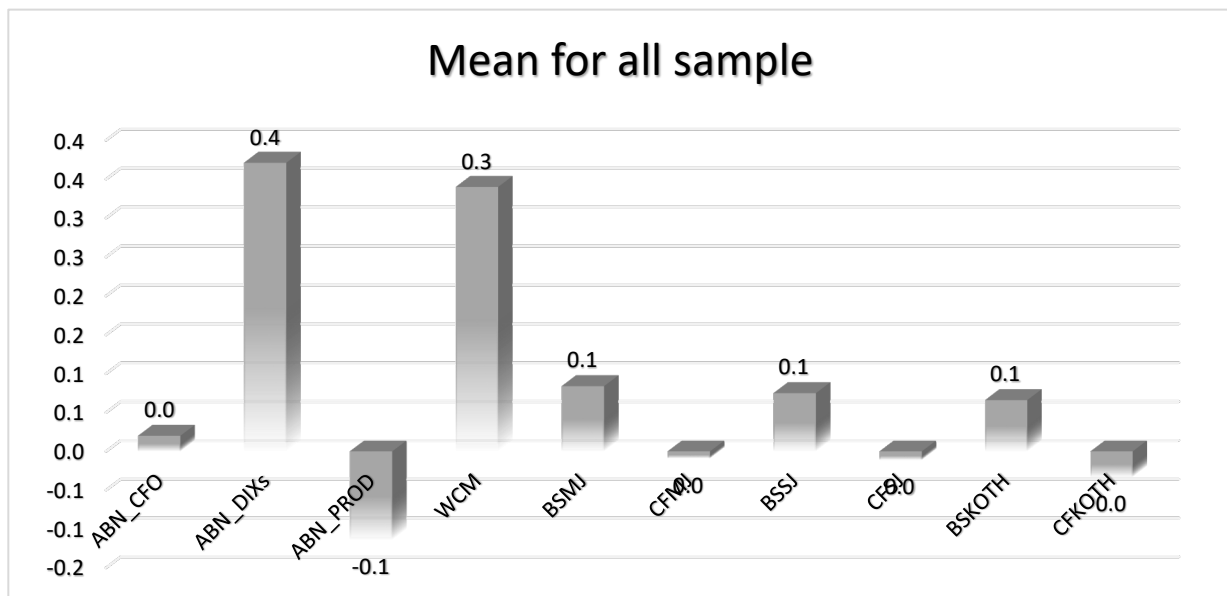
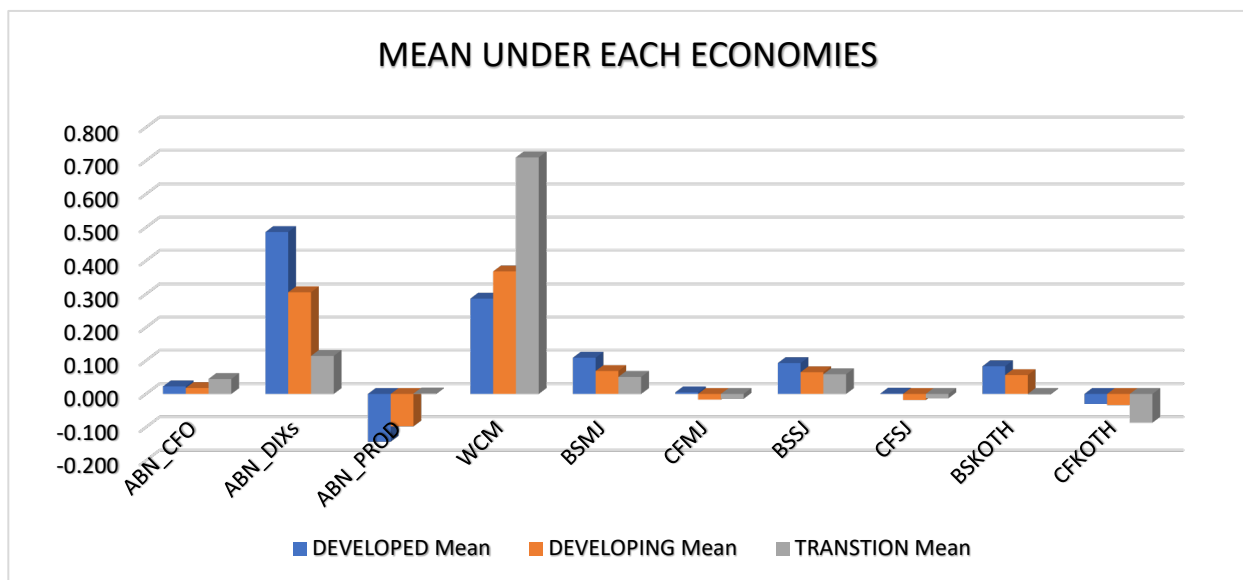


FIGURE 5.5. Mean values for developed, developing, and transition economies.



5.6 Controls variables Variable

The descriptive statistics of firm characteristics used as control variables in all economies, developed, developing, and in transition are presented in Table 5.5, and the mean in figures 5.6. What stands out in this table is that all control variables have positive mean values.

As predicted in this study, the performance has mean values of real income for developed economies (0.19), for developing economies (0.21) and for economies in transition (0.20), which indicates that the lowest percentages of firms in each economy have reported negative net income. This result is higher than [Francis and Wang \(2008\)](#) study which reported mean values for the negative net income of around (.045) However, their results were based upon data from 1994 to 2004, which is a different period from this study and they excluded all data from specific countries because of potential miscoding in the audit reports.

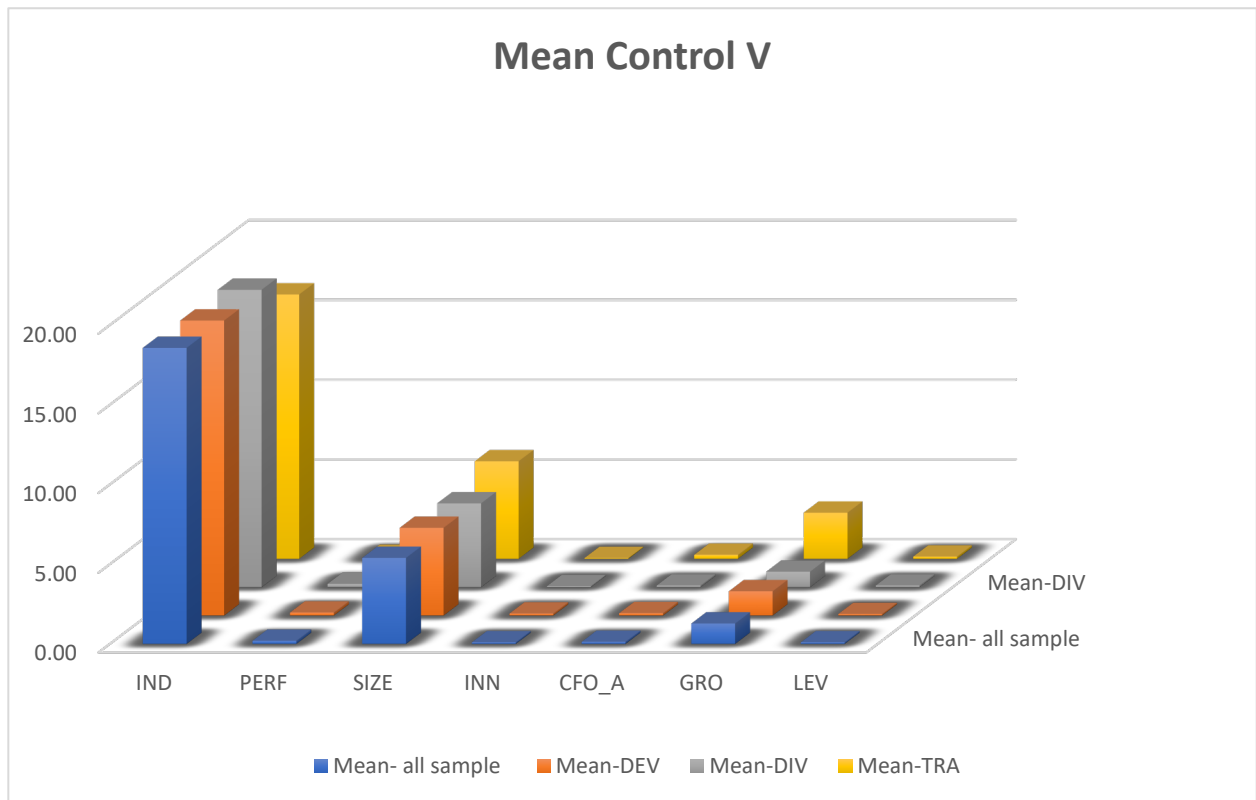
As predicted in this study, a positive sign resulted in each economy for the firm size. Firms' size has reported similar mean values in all classifications, each around 5%. The result was comparable to some degree with the study by [John and Adebayo, 2013](#) and, as they reported mean values around 8%. This result indicated that firms have a better internal control system, which decreases manipulations. Also, larger firms take into consideration the reputation cost. The mean values for the firm growth as predicated reporting the highest values are for transition and developed at (2.8), (1.5) respectively, followed by developing (0.97). The results indicate that earnings management is higher for growth firms. These results are higher to what has been reported in [Boone et al. \(2010\)](#) as the study reported positive mean value at (.15). The (CFO) has mean values were higher in transition (0.25), developed (0.15) followed by developing (0.11) which is higher than what was reported in [Habbash and Alghamdi \(2017\)](#) as they reported lower values (0.08). The mean value of leverage is higher in transition economies at (0.14) and developing economies (0.11) and lower in transition economies at (0.10), which is different from other studies such as [Almasarwah \(2015\)](#) who reported (0.03).

The main difference in our study is that the number of observations and the number of countries is different in both studies, which may impact the results. Adjusted RD reported mean values of (.05), (0.7) and (0.13) for transition economies, developing economies, and developed economies , respectively. Higher mean values in developed economies, which is predicted, as developed countries spend more on research and development than other economies. However, the results are higher than ([Hitt et al., 1991](#), [Prencipe et al., 2008](#)) as they reported (0.02). In Summary, the results demonstrate that developed economies have higher growth, cash flow, firm size and innovation than other economies, which is expected from developed economies.

TABLE 5.5. Mean values for control variables.

Variable	Full sample	Developed	Developing	transition
IND	18.57	18.5	18.65	16.58
PERF	0.2	0.19	0.21	0.2
SIZE	5.4	5.5	5.26	6.12
INN	0.1	0.13	0.07	0.05
CFO_A	0.13	0.15	0.11	0.25
GRO	1.28	1.53	0.97	2.89
LEV	0.11	0.1	0.11	0.14

FIGURE 5.6. Mean values for control variables.



5.7 Correlation Matrix

In this section, Pearson's correlation was run to assess the relationship between earnings management models and innovation strategy in all economic classifications around the world for firms from 2010 to 2018. Preliminary analysis showed the relationship to be linear, as assessed by Shapiro-Wilk's test ($p > .01$), while Pearson correlation coefficients reveal the coefficients that measure the linear direction and its strength between the variables. A zero value reveals no relationship and the range from (-1 to 1) a perfect negative or positive relationship. Prior research ([Wold et al., 1984](#)) indicated that the higher degree of existence variables resulted in a collinearity problem, especially when correlation coefficients are higher than ± 0.8 . Therefore, if a correlation coefficient is less than ± 0.8 , it indicates that the model is free from multicollinearity.

Table 5.6 shows the results of Pearson correlation coefficients between earnings management models and independent variables. The highest degree of correlation was in CFMJ and CFSJ at (0.9) with BSMJ and CFMJ which is predicated since both models are the same but the difference in the method of calculating the total accruals, therefore, this result would not be a concern in this research. None of the other variables is highly correlated with EM measures from all models, and this result indicates that the data are free from multicollinearity. There was a statistically significant relationship between research and development and earnings management models. The findings establish that there is a statistically significant positive association among firms that utilise earnings management and innovation, as CFMJ ($r = 0.128$, $p < 0.01$); CFSJ ($r = 0.122$, $p < 0.01$); BSMJ ($r = 0.186$, $p < 0.01$); BSSJ ($r = 0.175$, $p < 0.01$); BSKOH ($r = 0.066$, $p < 0.01$), CFKOH ($r = 0.054$, $p < 0.01$). ABN_CFO ($r = 0.161$, $p < 0.01$), ABN_DIX ($r = 0.194$, $p < 0.01$). ABN_PROD ($r = 0.213$, $p < 0.01$). and WCM ($r = 0.128$, $p < 0.01$). there is a significantly negative relationship between innovation and the firm size and

firm leverage ($r = -0.65$, $p < 0.01$) , ($r = -0.013$, $p < 0.01$) respectively. Furthermore, there is a positive relationship between cash flow and innovation, as well as firm growth and innovation.

The positive relationship between accruals manipulation and real activities manipulation is not consistent with prior studies ([Roychowdhury, 2006](#), [Cohen et al., 2008](#), [Barth et al., 2001](#)) as they indicated that there is a negative relationship between accruals and real activities. The difference may suggest that executives use both manipulations aggressively at the same time in order to achieve their incentives.

The result also shows a significant positive relationship between earnings management models and firm growth; this result shows that firms that grow engage in manipulation of financial reports. The positive relationship between cash flow and the earnings management model indicates that firms having better performance engage less in manipulations. Also, there is a positive relationship between firm size and Modified Jones and real activities, which indicates that large firms do engage in manipulations.

Variables	R1	R3	R2	WCM	M2	M5	M1	M4	M3	M6	Size	PERF	GRO	CFO_A	LEV	IND
R1	1															
R3	.357**	1														
R2	.499**	.582**	1													
WCM	.325**	.267**	.391**	1												
M2	.352**	.304**	.444**	.225**	1											
M5	.672**	.346**	.446**	.321**	.315**	1										
M1	.330**	.277**	.428**	.216**	.961**	.297**	1									
M4	.667**	.333**	.440**	.327**	.306**	.970**	.290**	1								
M3	.060**	.045**	.121**	.031**	.216**	-0	.214**	-0	1							
M6	.216**	.046**	.112**	.066**	.075**	.117**	.072**	.120**	.415**	1						
Size	-.044**	.081**	.151**	.104**	.121**	.047**	.120**	.032**	-.037**	-.118**	1					
PERF	.034**	-.036**	-.041**	-.012**	-.023**	-.068**	-.024**	-.066**	.058**	.061**	-.183**	1				
GRO	.064**	.085**	.140**	.055**	.093**	-0	.091**	0	.515**	.478**	.006*	.010**	1			
CFO_A	.037**	.452**	.377**	.327**	.392**	.162**	.381**	.150**	.066**	-.009*	.213**	-.134**	.095**	1		
LEV	-.023**	.011**	0	.042**	.034**	.101**	.035**	.101**	-.048**	-.049**	.067**	-.533**	-.022**	.142**	1	
IND	0.00	-.019**	-.039**	-.025**	-.020**	0	-.017**	0.00	-.020**	-0	-.050**	0	-.019**	-.018**	0.00	1
INN	.161**	.194**	.213**	.128**	.186**	.128**	.175**	.122**	.066**	.054**	-.065**	.017**	.065**	.177**	-.013**	0.00

*, Correlation is significant at the 0.05 level (2-tailed) **, Correlation is significant at the 0.01 level (2-tailed)

TABLE 5.6. Correlation table.

5.8 Test of Regression Assumptions

5.8.1 Regression Assumptions

Normality, Multicollinearity, Heteroscedasticity and Autocorrelation, and Linearity

It is a critical point before analysing the data using linear regressions that several tests should be performed to make sure that the data can be used for testing. Violations of these assumptions can result in a biased estimate of the relationship ([Williams et al., 2013](#)), [Caylor \(2010\)](#) According to [Uyanık and Güler \(2013\)](#), among the essential multilinear regression assumptions are normality of error terms distribution, multicollinearity, homoscedasticity and autocorrelation and linearity. In this section, this PhD reviewed these assumptions, the measurement of these assumptions in the event of their violation. Moreover, substantial way to deal with the violation.

Since this PhD employs the following model to test the hypotheses:

$$EM_1 = \alpha_0 + \beta_1 INV + + \beta_2 FSize + \beta_3 GRO + \beta_4 IND + \beta_5 lev + \beta_6 CFO \\ + \beta_7 PERFORMANCE + e..(1)$$

In this research, all regression models under all of the stages are the same, and the only difference lies in the dependent variable, which is earnings management.

Normality:

Normality refers to the normality of residuals. If the result is not skewed or kurtotic variables, then the assumption is satisfied. [Tabachnick et al. \(2007\)](#) examined the residuals in regression and discussed the outliers and the removal of univariate and bivariate outliers. The removal of outliers can improve the estimation. According to [Osborne and Waters \(2002\)](#), normality in regression assumes that the variables utilised have normal distributions. The error terms should have a normal distribution, and any violation of this assumption will result in differences between P-value and true P-value .A normal distribution of data was tested. The main ways

to test for normality are statistics and graphical. Graphical includes probability plot, scatter and histogram and statistics include skewness, kurtosis and Kolmogorov-Smirnov. For normality of the residuals, however, according to [Donnelly \(2012\)](#), the non-normally distributed data do not impact the coefficient for extensive data. [Ghasemi and Zahediasl \(2012\)](#) indicated that data with a hundred observations could ignore the distribution of the data and the violation of the normality assumption should not cause the main issue. ([Adkins, 2011](#)), [Roychowdhury \(2006\)](#) supports the idea of relaxing this assumption and considers it as optional. Other studies ([Schmidt and Finan, 2018](#)) have found that it is not essential to meet normality assumptions. Therefore, using STATA, histogram test was performed. The result indicates that the results for all models are not normally distributed. Therefore, the normality distribution can be ignored as the data size is large enough, and the coefficient does not impact with the non-normal distribution. However, the normality was solved by the transformation of the variables, as indicated in the linearity section.

Homoscedasticity and Autocorrelation

Homoscedasticity means that the error terms are the same across all the levels of independent variables. When there is variance, then homoscedasticity exists. [Berry \(1993\)](#) indicated that heteroscedasticity has less impact, but it can lead to weaknesses in the analysis. [Ghasemi and Zahediasl \(2012\)](#) stated that residuals are randomly scattered around 0 and can be deduced by graphical, Park test, Goldfeld-Auand test and others. However, in the case of existence, corrective measures can be used, such as weighted least squares ([Damodar N, 2004](#)). Breush-Pegan/Cook-Weisberg test is employed in order to assess the heteroscedasticity. The outcome of the test rejected the null hypothesis, which is the variance of the residuals is homogenous. In other words, the models are not free from heteroscedasticity. [Damodar N \(2004\)](#) indicated that hypothesis testing is not valid when a model has an autocorrelation. Autocorrelation of linear regression is that the errors are independent. Following prior studies, a Durbin–Watson

test (Wooldridge test for autocorrelation in panel data) was employed. The result in Table 5.7. implies that the residuals are uncorrelated. However, the models suffer from autocorrelation. Therefore, following prior researches, the [Rousseeuw and Christmann \(2003\)](#) procedure was employed to solve the heteroscedasticity and autocorrelation issues. The procedure has no impact on the coefficients of the model, but it will correct the standard errors as well as the significance level. The results, heteroscedasticity and autocorrelation and linearity for this PhD data, are summarised in Table 5.7.

Multicollinearity

According to [Mansfield and Helms \(1982\)](#) multicollinearity occurs when variables are highly correlated in regression models; specifically, it occurs among independent variables. As a result, the regression model and slope terms might not be accurately estimated. There are some indications of multicollinearity, such as standard error slope is inflated (large) compare to projected slope terms. Also, when there are high correlation coefficients among independent variables. Also, [Alin \(2010\)](#) indicated that the variance inflation factor (VIF) is utilised as an index to determine whether there is multicollinearity. According to , more than 58,000 researches on Google Scholar utilised VIF statistics to eliminate multicollinearity issues. The rule, according to ([Kalnins](#)), is that if maximum VIF is less than 10, then multicollinearity is considered not to exist. Variance inflation factors (VIFs) are presented in Table 5.8 indicate that there are no multicollinearity issues.

Linearity

Linearity is one of the assumptions that the examiner should test to make sure that the result is not biased. Non-linear prediction should not be used in linear models. This research examines that the linearity function is present in the model where the outcome is a linear of the predictors. In other words, this assumption must be met to justify the use of OSL regression. Following prior research, any non-linear data can be dealt with using transformations. As

shown in Table 5.7, the models suffer from linearity problem as Joint Wald (test of linearity) Indicate; therefore, Van der Waerden normal score was utilised to solve the linearity problem; Also, it also solves the normality issue, as stated previously.

TABLE 5.7. Regressions assumptions tests.

	1	2	3
R1	chi2(1) = 3259.80 Prob > chi2 = 0.0000	F(1, 4943) = 65.037 Prob > F = 0.0000	F(7, 51364) = 3286.08 Prob > F = 0.0000
R3	chi2(1) = 11.91 Prob > chi2 = 0.0006	F(1, 9628) = 660.124 Prob > F = 0.0000	F(7, 84483) = 4537.78 Prob > F = 0.0000
R2	chi2(1) = 89.26 Prob > chi2 = 0.0000	F(1, 1812) = 53.780 Prob > F = 0.0000	F(7, 20399) = 1372.36 Prob > F = 0.0000
WCM	chi2(1) = 653.15 Prob > chi2 = 0.0000	F(1, 8046) = 145.006 Prob > F = 0.0000	F(7, 67703) = 2390.02 Prob > F = 0.0000
M2	chi2(1) = 653.03 Prob > chi2 = 0.0000	F(1, 8038) = 8.179 Prob > F = 0.0042	F(7, 73914) = 3712.88 Prob > F = 0.0000
M5	chi2(1) = 1678.08 Prob > chi2 = 0.0000	F(1, 8038) = 8.179 Prob > F = 0.0042	F(7, 59972) = 2459.26 Prob > F = 0.0000
M1	chi2(1) = 634.89 Prob > chi2 = 0.0000	F(1, 8436) = 12.414 Prob > F = 0.0004	F(7, 76247) = 3500.59 Prob > F = 0.0000
M4	chi2(1) = 2153.53 Prob > chi2 = 0.0000	F(1, 6865) = 63.429 Prob > F = 0.0000	F(7, 61730) = 2442.66 Prob > F = 0.0000
M3	chi2(1) = 390.92 Prob > chi2 = 0.0000	F(1, 7117) = 16.398 Prob > F = 0.0001	F(7, 67275) = 3427.60 Prob > F = 0.0000
M6	chi2(1) = 2516.43 Prob > chi2 = 0.0000	F(1, 3878) = 66.552 Prob > F = 0.0000	F(7, 42271) = 2799.41 Prob > F = 0.0000

- 1- Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
- 2- Wooldridge test for autocorrelation in panel data
- 3- Joint Wald (test of linearity).

TABLE 5.8. VIFs for the earnings management's models.

Variables	M4	M1	M6	M3	M5	M2	WCM	R1	R3	R2
GRO	1.78	2.59	2.19	2.47	2.64	1.81	2.61	1.78	2.56	1.67
CFO_A	1.71	2.55	2.07	2.44	2.62	1.8	2.6	1.76	2.53	1.62
PERF	1.48	1.39	1.44	1.46	1.33	1.37	1.34	1.38	1.4	1.47
LEV	1.45	1.39	1.41	1.45	1.32	1.36	1.34	1.37	1.38	1.45
SIZE	1.13	1.09	1.13	1.11	1.09	1.09	1.09	1.09	1.1	1.15
INN	1.09	1.08	1.1	1.06	1.08	1.08	1.08	1.07	1.09	1.1
IND	1	1	1.01	1	1	1	1	1	1	1
Mean VIF	1.38	1.59	1.48	1.57	1.59	1.36	1.58	1.35	1.58	1.35

If VIF is greater than 4, the independent variable is considered to have multicollinearity

5.8.2 Regression Analysis Results

To test the hypothesis, which predicted that there is a relationship between innovation strategy and earnings management, as mentioned in chapter 3, in order to capture the manipulation impact. The study utilised numerous earnings management models. Following ([Kothari et al., 2005](#), [Rivest, 1994](#)), the control variables were winsorized to eliminate the extreme values by using the same procedure setting the top one percent and the bottom the same (1st and 99th).

Table 5.9 reports results of OLS regression of discretionary accruals, WCM, real activities, earnings management on innovation strategies. The results for the P-value for each economy indicate that all of the models are statistically highly significant as $P < 0.001$ but in M4 and M6 in transition economies was $P < 0.005$. In terms of adjusted R2, Table 5.9 and figure 5.7 shows that there was much difference between developed economies, developing economies, and transition economies, which indicate that the models are more potent in deducting the relationship with control variables in transition economies., followed by developed economies than developing economies. Modified jones and standard jones balance sheet approach provided higher values than the cash flow approach. Also, real activities models have higher R2 than accruals models.

FIGURE 5.7. Regression result (R2) models fit

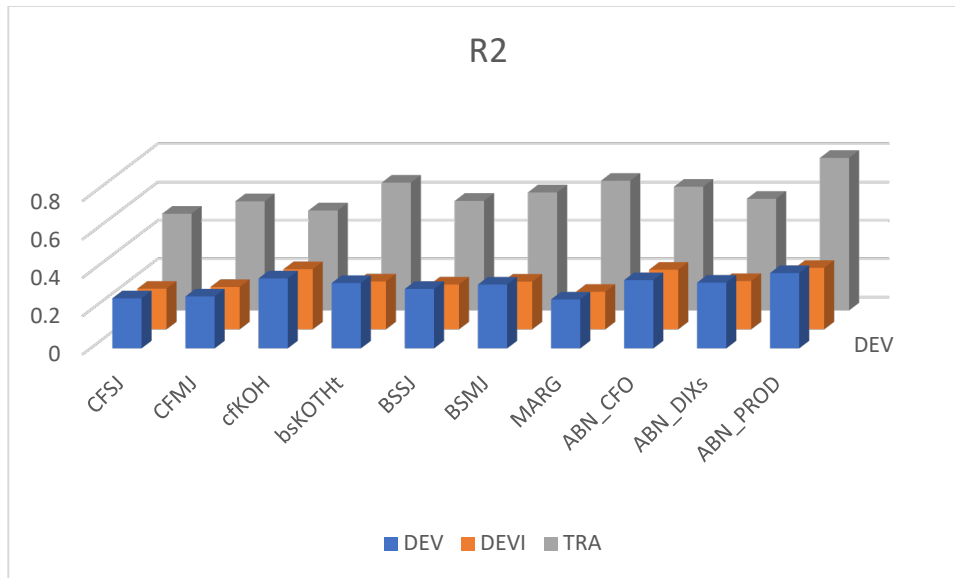


TABLE 5.9. Regression result (R2) models fit

ECO	M4	M1	M6	M3	M5	M2	WCM	R1	R3	R2
DEV	0.261	0.271	0.365	0.341	0.31	0.333	0.255	0.356	0.343	0.393
DEVI	0.212	0.221	0.314	0.25	0.234	0.249	0.196	0.311	0.252	0.321
TRA	0.504	0.569	0.521	0.666	0.571	0.615	0.676	0.645	0.582	0.795

5.8.3 Innovation strategy and earnings management vs non-innovated firms.

To test for **H1**, and to determine if a difference exists between the means of innovated firms and non-innovated firms, this research used Bayesian independent test to find whether the difference between the innovated and non-innovated firms is statistically significant.

As shown in figure 5.5, the descriptive statistic for Bayesian test indicates that M2, M3, M6, R1, R2, and R3 are higher in non-innovated firms, while WCM, M1, M4, and M5 are higher in innovated firms. To understand whether these mean differences are a result of higher manipulation or due to other factors, a Levene's was performed.

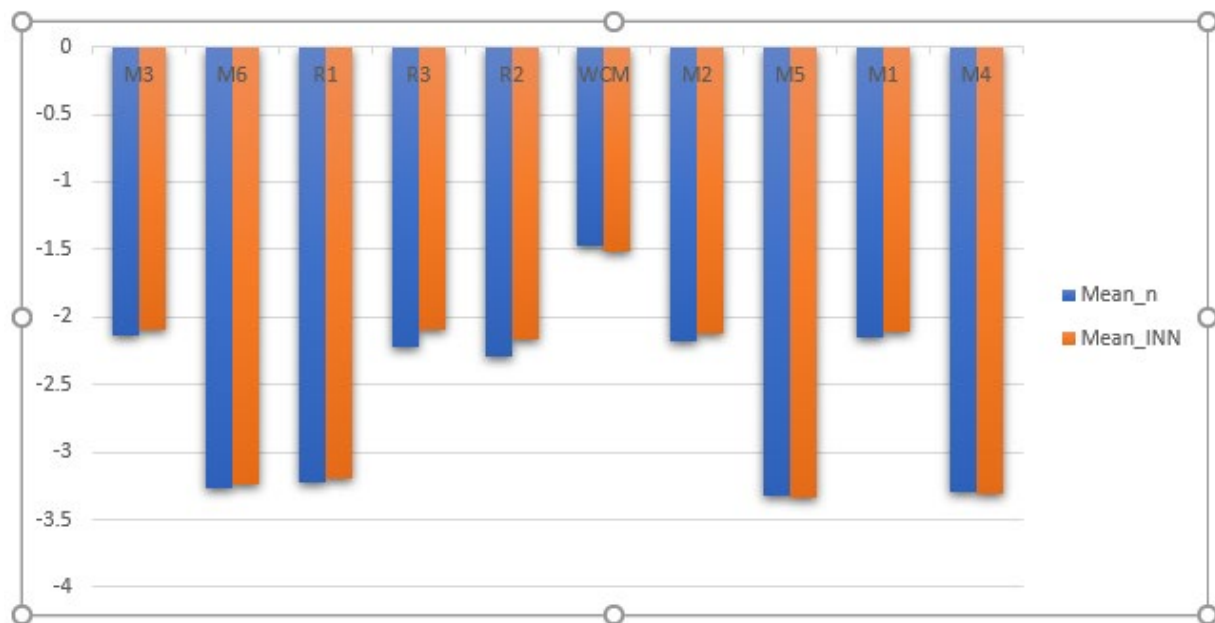
We assumed that there are no differences between the variances of each model, unlike the Bayesian independent test, in which we tested whether the mean of the models is different. With Levene's test, we test if the model's variances are the same and non-significant. So, if sig, is more significant than .05, Leven's test is non-significant, so equal variances are assumed.

As shown in Table 5.10, there was homogeneity of variances for M5 and M4. As a result, the assumption of homogeneity of variances was violated, as assessed by Levene's test for equality of variances for M1, M2, M3, M6, R1, R2, and R3. Therefore, Mann-Whitney Test is used.

TABLE 5.10. Levene's test for equality of variances

Model	F-TEST	Sig.	T	Sig. (2-tailed)
R1	11.02	0.001	-2.258	0.024
R3	39.15	0.000	-10.91	0.000
R2	7.442	0.006	-5.520	0.000
WCM	45.51	0.000	3.524	0.000
M2	18.6	0.000	-5.597	0.000
M5	0.234	0.628	1.815	0.070
M1	14.41	0.000	-4.998	0.000
M4	0.199	0.655	1.496	0.135
M3	18.56	0.000	-4.498	0.000
M6	23.49	0.000	-1.194	0.232

FIGURE 5.8. Mean values for EMs under innovated and non-innovated firms.



A Mann-Whitney U test conducted to evaluate the hypothesis that innovated firms have high manipulations than non-innovated firms, on the average, the result of the test were in the expected direction and significant for real activities models, standard jones and modified jones under balance sheet approach and performance. $Z = -2.49$, $P < .05$ innovated firms had an average rank of 29440, while non-innovated had an average rank of 29068 for R1, and the $Z = -11.88$, $P < .05$. Tables 5.12 shows that innovated firms had an average rank of 50322. In contrast, non-innovated had an average rank of 48074 for R3, and the $Z = -5.62$, $P < .05$ innovated firms had an average rank of 12031, while non-innovated had an average rank of 115031 for R2, the $Z = -4.88$, $P < .05$ innovated firms had an average rank of 43116, while non-innovated had an average rank of 42246 for M2, the $Z = -4.28$, $P < .05$ innovated firms had an average rank of 44370,

while non-innovated had an average rank of 43596 for M1, the $Z = -3.57$, $P < .05$ innovated firms had an average rank of 39056, while non-innovated had an average rank of 38448 for M3, and the $Z = -2.11$, $P < .05$ innovated firms had an average rank of 24363, while non-innovated had an average rank of 24077 for M6. While $Z = -5.10$, $P > .05$ innovated firms had an average rank of 38046, while non-innovated had an average rank of 38916 for WCM. $Z = -3.71$, $P > .05$ innovated firms had an average rank of 34458, while non-innovated had an average rank of 35051 M5, and $Z = -3.25$, $P > .05$ innovated firms had an average rank of 35499, while non-innovated had an average rank of 36025 for M4.

In summary, real activities models such as abnormal cash flow, abnormal discretionary expenses, and abnormal production have higher mean values in innovated firms than in non-innovated firms. Furthermore, the results for accruals models such as standard Jones and modified Jones under the balance sheet approach, and the Kothari model under both

approaches, indicated that innovated firms have higher ranking mean values than non-innovated firms. The results for the cash flow approach for the modified Jones and standard Jones and performance models indicate that non-innovated firms have higher ranking mean values than innovated firms. This result provides a clear indication that one group ranked higher than the other; therefore, this result does support H1, which stated that innovated firms have higher earnings management under earnings management with the real activities model, with the accruals model under the balance sheet approach, and with the Kothari model. However, this result also does not support H1 under the standard Jones, modified Jones using cash flow approach, or WCM models.

This result is in contrast to those of other studies, such as that of ([Jeppson and Nathan 2012](#)), who calculated total accruals using the cash flow approach, which suggests that firms that invest in innovation have higher earnings management. ([Jeppson and Nathan](#)) (2017) based their theory on the fact that the highest discretionary accruals are an indication of higher manipulation, but their study fails to consider the different categories of research and development. Instead, innovation was divided into high and low innovated firms and the low innovated firms were considered as proxies to non-innovation, which could explain why the current research found a different result. The current study considered firms with no research and development as non-innovated firms, and this researcher believes that lower levels of innovation do not indicate non-innovated firms, as different innovated firms are affected by industry, firm size and cash flow availability, which, in turn, impact the size of innovation. Therefore, [Jeppson and Salerno](#) (2017) should not have presumed that firms with lower levels of innovation funding could be equated with non-innovated firms. Furthermore, [Jeppson and Salerno](#) (2017) did not compare earnings management for both values using independent testing or any statistical tests. Therefore, we argue that the findings of the current study

provide stronger evidence regarding earnings management in innovated and non-innovated firms.

Moreover, this paper assumes that earnings models are not the same as a result, which suggests the cash flow approach may have been involved in the different results across this study, and the Mann-Whitney analysis is no different. [Dechow and Skinner \(2000\)](#) presented evidence that the cash flow approach for the Standard Jones model was not an ideal choice, since the model did not fit well with firms that have extreme cash flow values. ([Alzoubi, 2016](#), [Peasnell et al., 2000](#)) found that firms with extremely high cash flow resulting from operations will automatically have higher levels of earnings management. Also, the WCM provides different results than real activities models and accruals, which could be due to the fact that the model also works well when firms have abundant cash flow ([Kighir et al., 2014](#)), and non-innovated firms tend to have a higher cash flow, in general. In summary, cash flow affects the results of the three models, which also align with the research hypothesis that innovated firms will have lower cash flow due to their support of innovation, and therefore, non-innovated firms will have higher cash flow. We could argue, then, that innovated firms have higher levels of manipulation than non-innovated firms under the condition of calculating the total accruals.

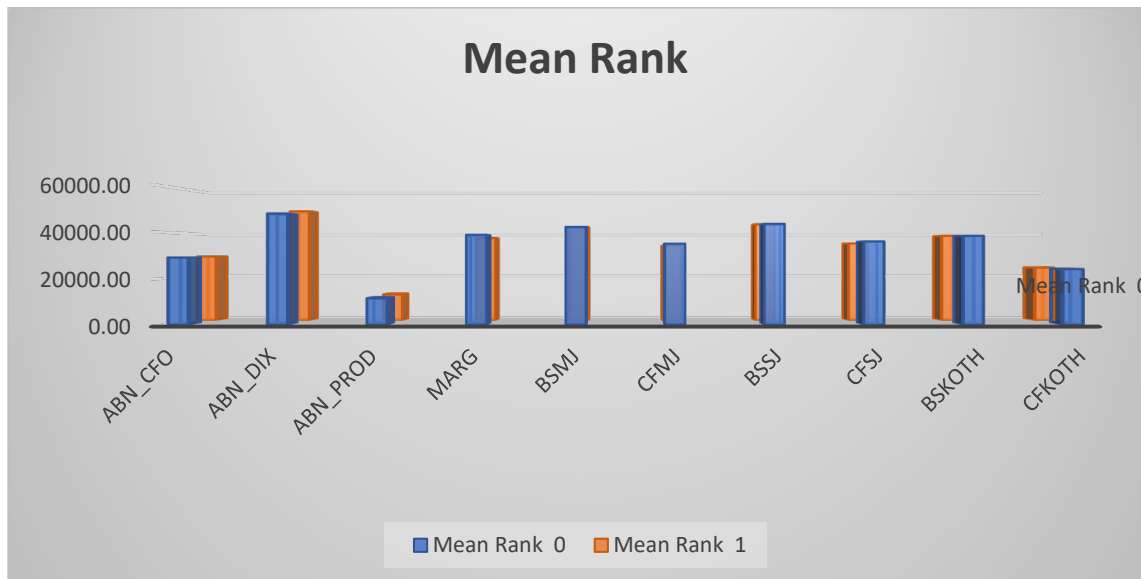
TABLE 5.11. Test Statistics, Manny-Whitney Test

Model	Z	Asymp. Sig. (2-tailed).
R1	-2.499	0.012
R3	-11.808	0.000
R2	-5.621	0.000
WCM	-5.107	0.000
M2	-4.887	0.000
M5	-3.713	0.000
M1	-4.284	0.000
M4	-3.252	0.001
M3	-3.576	0.000
M6	-2.113	0.035

TABLE 5.12. Levene's test for equality of variances

Model	N	Mean Rank.	T
R1	39427	29068.17	N
R1	18950	29440.41	INNOVATED
R3	64378	48074.74	N
R3	33303	50322.26	INNOVATED
R2	15732	11502.46	N
R2	7617	12031.36	INNOVATED
WCM	51568	38916.72	N
WCM	25686	38046.85	INNOVATED
M2	56278	42246.61	N
M2	28803	43116.21	INNOVATED
M5	45171	35051.43	N
M5	24514	34458.93	INNOVATED
M1	58039	43596.6	N
M1	29677	44370.69	INNOVATED
M4	46504	36025.94	N
M4	25177	35499.39	INNOVATED
M3	51373	38448.58	N
M3	25931	39056.49	INNOVATED
M6	32555	24077.62	N
M6	15786	24363.57	INNOVATED

FIGURES 5.9. Ranking means under Manny Test



5.9 Accruals Earnings, and margin and Innovation in Developed, Developing and Transition Economies

Multiple regression was performed to determine the relationship between innovation strategies and accruals and performance models. All the models are statistically highly significant, as $p < 0.001$.

The regression equation predicted a positive relationship between the models and innovations. Table 5.13 presented that the t values for innovation in developed economies are statistically highly significant, as $p < 0.001$ for standard Jones under balance sheet approach the t-value is (14.53), and the coefficient is positive at (0.668***), under cash flow approach the t-value is (7.19), and the coefficient is positive at (0.408***). In the same way, Modified Jones cash flow approach the t-value is (7.70), and the coefficient is positive at (0.454***), in balance sheet approach the t-value is (15.33), and the coefficient is positive at (0.719***). The Kothari model also shows the same pattern with the t-value is (14.01) and the coefficient is positive at (0.667***) under balance sheet approach, and the t-value is (5.67), and the coefficient is positive at (0.382***) under cash flow approach. The performance model was not different as it reported the t-value is (13.48) and the coefficient positive at (0.650***). All of these results support this research's **H2**, which stated that there is a positive relationship between innovation strategy and accruals in margin earnings management in developed economies.

TABLE 5-13 Earnings management and innovation

	DEVELOPED		DEVELOPING		TRANSITION	
	Coef.	t-value	Coef.	t-value	Coef.	t-value
INNOVATION FIRMS						
M1	0.668***	15	0.555***	7.42	3.476	1.21
M4	0.408***	7.2	0.357***	3.53	2.785	0.67
M5	0.408***	7.7	0.388***	3.96	-0.38	-0.49
M2	0.719***	15	0.601***	7.65	-0.18	-0.23
M3	0.382***	14	0.305***	2.77	11.57	1.17
M6	0.382***	5.7	0.610***	7.82	4.833	0.176
WCM	0.650***	13	0.483***	6.27	12.88**	3.19

To test **H3**, linear regression was performed, and results indicate that the t values for innovation in developing economies are also statistically highly significant, as $p < 0.001$. In standard Jones under balance sheet approach, the t-value is (7.42), and the coefficient is positive at (0.555***), under cash flow approach the t-value is (3.53), and the coefficient is positive at (0.357***). In the same way, in Modified Jones cash flow approach the t-value is (3.96), and the coefficient is positive at (0.388***), in balance sheet approach the t-value is (7.65), and the coefficient is positive at (0.601***). Kothari's model also shows the same pattern where the t-value is (2.77) and the coefficient is positive at (0.305***) under cash flow approach, while under balance sheet approach the t-value as (7.82) and the coefficient positive at (0.610***). WCM was not different as it reported the t-value as (6.27) and the coefficient positive at (0.483***). These results support the **H3** hypothesis, which indicated that there is a positive relationship between innovation strategy and accruals and margin earnings management in developing economies

To test **H4**, linear regression was completed, and results indicate that the t values for innovation in transition economies are statistically significant in one of the models and not statistically significant in others.

In standard Jones under balance sheet approach, the t-value is (1.21), and the coefficient is positive at (3.476), Modified Jones under balance sheet approach t-value is (0.67), and the coefficient is positive at (2.785). Similarly, cash flow approach reported insignificantly in standard Jones where t-value is (-0.49), and the coefficient is negative at (-.384), and in Modified, Jones t-value is (-0.23), and the coefficient is negative at (-0.177). Kothari reported similar to balance sheet approach where t-value is (1.17), and the coefficient is positive at (11.57) under cash flow approach, and t-value is (0.176), and the coefficient is positive at (4.833) Lastly, the working capital model reported different where t-value is (3.19), and the coefficient is positive at (12.88**). Therefore, these results in accruals model do not support **H4** but under the performance model.

These results showed a strong positive association with innovation, which indicates that innovated firms use discretionary accruals models to manipulate their financial reports in order to increase accrual results. This allows an increase in spending on innovation and a decrease in manipulation of spending in both developed and developing economies, and WCM in economies that are in transition. These results are consistent with many prior studies, though [Jeppson and Salerno \(2017\)](#) reported a negative coefficient (-2.94) for economies in transition. Different studies have found a positive relationship; for instance, [Shust \(2015\)](#) indicated that the relationship between discretionary accruals and innovation is positively correlated. One interpretation of our results is that executives in developed and developing economies are less concerned about higher and smooth earnings than they are about spending on innovation. It also appears from the findings that executives in developed and developing economies engage in accrual manipulation to sufficiently fund the innovations.

In transition economies, executives are more concerned about earnings, and therefore, they decrease innovation where possible. [Kouaib and Jarboui \(2016\)](#) stated that executives might seek to please shareholders and the market by enhancing current earnings and sacrificing future profits in transition economies, while according to [Baber et al. \(1991\)](#), firms that reported positive earnings in current periods were more likely to spend less on innovations.

Furthermore, spending on innovation could bring future economic benefits. IFRS, with its treatment approach to innovation, allows innovation expenditures to be capitalised upon in the future, which may offer executives the opportunity to spend more on innovation in the present, with the knowledge that it will pay off in the future. Uncertainty of future economic benefit projects could also benefit executives by justifying missing earnings. [Liu \(2016\)](#) found a positive relationship between earnings management and added economic value in developing countries, while [Sirbu \(2012\)](#) argued that added value is one of the tools that can be used by executives to bring about alignment with shareholder objectives, since it increases accountability and enhances the firm's performance. Based on the results from this study, it is fair to say that firms receive more benefit from supporting innovations through the manipulation of financial reports.

However, the results also show that firms in transition economies had no statistical significance, which suggests that executives in these economies put very little focus toward increasing innovation; this aligns with [Graham et al. \(2005\)](#) study, which stated that 85% of executives agree, or strongly agree, on the importance of reporting higher earnings than previous years. An explanation for this, according to [Bartz-Zuccala et al. \(2018\)](#), is that the Soviet government (one of the countries considered, in this study, to have a transition economy) controls the allocation of innovation and places it where it is essential to their power. Furthermore, their study showed that the dissolution of the USSR resulted in job losses for innovators and fewer firms supporting innovation. Therefore, in this case, higher levels of

accrual manipulation resulted in lower levels of support for innovation. An alternative explanation of these results is that the sample size from transition economies in this study is smaller than those for the developed and developing economies, which may have affected the results. In summary, the models reported a positive but insignificant relationship, while the cash flow approach showed an insignificant negative relationship, which suggests that while there may be a relationship, it is not a strong one, and that this is due to the political structures of countries and the preferences of executives for earnings over innovations.

5.10 Real Activities Earnings and Innovation

Real activities models provide a similar view as accruals models; in developed economies, the finding is highly statistically significant as $p < 0.001$. Table 5.14 shows that ABN_CFO reported t-value is (9.47) and there is a positive coefficient (0.515 ***), ABN_DIX reported t-value is (17.21) and there is a positive coefficient (0.686 ***), and ABN_PROD reported t-value is (10.50) and there is a positive coefficient (0.819 ***). These results do not support **H5** but do support **H8**. On the same direction the developing economies, the finding is highly statistically significant as $p < 0.001$, reported ABN_CFO reported t-value is (6.31) and there is a positive coefficient (0.531 ***), ABN_DIX reported t-value is (8.53). There is a positive coefficient (0.618 ***), and ABN_PROD reported t-value is (9.00), and there is a positive coefficient (0.1.161 ***). These results do not also support **H6** but support **H9**. In transition economies, the finding is not statistically significant at abnormal cash flow but statistically significant in abnormal discretionary expenses and abnormal production as $p < 0.005$. The ABN_CFO reported t-value is (1.31) and there is a positive coefficient (1.942), ABN_DIX reported t-value is (2.29), and there is a positive coefficient (15.55**), and ABN_PROD reported t-value is (2.23) and there is a positive coefficient (7.429*). These results do not support **H7** but support **H10**,

TABLE 5.14. The regression result underdeveloped, developing, transition economies

	DEVELOPED			DEVELOPING			TRANSITION		
	Coef.	t-value	p> t	Coef.	t-value	p> t	Coef.	t-value	p> t
INNOVATION FIRMS									
R1	0.515***	-9.5	0.00	0.555***	-6.31	0.00	1.924	-1.31	-0.2
R2	0.686***	-17	0.00	0.357***	-8.53	0.00	15.55*	-2.29	-0.03
R3	0.819***	-11	0.00	0.388***	-9.00	0.00	7.429*	-2.23	-0.05

As predicted, there was a positive relationship between innovation strategy and discretionary expenses manipulation in developed and developing economies and in transition economies. What was not predicted, however, was that abnormal cash flow and abnormal production in developed economies, developing economies and transition economies had positive relationships to innovation, which indicates that executives increase overproduction and accelerate sales while simultaneously decreasing other expenses. This might, in turn, allow them to support innovation strategies. These results are not aligned, however, with [Jeppson and Salerno \(2017\)](#), who reported a negative significant t value. Further to this, another study by [Eberhart et al. \(2004\)](#) examined the relationship between abnormal stock and innovation funding, and their findings were also similar in terms of significance, but not, however, with regard to the sign of the coefficient relationship. The study, which examined 8,313 firms between 1995 and 2000, showed that firms that increase their innovation expenses do not portend any significant increase in their level of stock. The results of the current research indicate that executives do engage in overproducing and sales manipulation while also funding innovations. It is possible that executives also use other techniques to receive the benefits of supporting competitive strategies, such as accrual manipulation and innovation credits. The results also suggest that real activities manipulation might not be of much benefit when it comes to increasing cash flow to fund innovations, but our findings show that executives did engage in real activities manipulation and that they acknowledged that engagement will lower cash flow for their firms. It is expected by the firms that the lower cash flow will be offset by an increase of cash from increasing discount sales, customer credit and from the sales of goods that were overproduced. On other words, by sacrificing the future economic benefit of increasing abnormal manipulation to support innovation, executives in innovated firms might not be concerned about earnings as much as they are about facilitating innovation. ([Roychowdhury, 2006](#)) stated that while it can be beneficial for firms to offer sales during the

year, overproduction does not offer the same benefits to all industries. We argue that any decrease in sales must not be significant enough to affect the firm's cash flow, in which case, executives will still be able to manipulate sales and overproduction to the degree that will not affect the funds available for innovation. Another explanation could be that executives have different sources of funding, and even if they have lower cash flow through manipulation of abnormal sales and abnormal production, they are able to generate the funds from elsewhere to support innovation strategies.

In the context of transition economies, the real activities model indicates there is no significant relationship between abnormal cash flow and innovation, which suggests that the practices used to increase sales do not impact innovation reduction, as the relationship was positive but not significant. In other words, executives might increase overproduction and accelerate sales while at the same time supporting innovation to some degree, since the coefficient results were positive, which may suggest that executives use innovation support as justification for not achieving higher earnings. Another explanation for abnormal cash flow could be related to the sample sizes for transition economies, as they were only represented by 7% of the firms included in this study, compared to 37.2% for developed economies, 62% for developing economies

5.11 Preferred method

As stated previously, both the accruals and real activities models were statistically highly significant, as $P < 0.001$ in all models; in addition, the accruals model and the real activities model each reported a similar mean and medium. Therefore, one of the most important findings related to the methods preferred by executives is that, overall, firms preferred abnormal production and abnormal cash flow. This is despite the fact that accruals are still used by a large percentage of executives in innovation firms. The R² results suggest that abnormal production in developed economies, developing economies, and transition economies has the highest R², followed by the Kothari accruals model. Furthermore, abnormal cash flow, modified Jones and standard Jones balance sheet have close R² scores. Finally, abnormal discretionary expenses had the lowest R² among all of the models.

If we eliminate the abnormal discretionary expense model, these results for the real activities models are higher in R² than accruals. However, this study argues that R² should not be used as an indicator for reference methods, as an increase or decrease in abnormal activities can be affected by other variables that fall beyond the control of a firm, such as economic performance, interest rates, and politics. [Thomas and Zhang \(2002\)](#) examined overproduction manipulation, and they indicated that executives overproduce to reduce fixed costs, but they did not rule out the economic conditions that may impact firms. We argue that the accruals models suffered from the distinction between discretionary accruals and non-discretionary accruals, which could bias the earnings management results in the same way that abnormal activities models suffer from the omission of economic changes, for example, firms may offer a considerable discount on products that are not preferred by consumers. Executives want to offer a massive discount to push the products and reduce the cost of inventory storage. Abnormal activities considered this action to be abnormal, and therefore, it can be considered earning manipulation. These kinds of actions by executives is becoming regular practice, and

therefore, both methods are being used to achieve the goals of firm executives. These results do not support H11, H12 or H13. [Fields et al. \(2001\)](#) pointed out that examining one method of manipulation cannot provide the impact of earnings management on the variable, while [Zang \(2011\)](#) stated that the trade-off between two manipulation methods is based on the cost. [Cohen and Zarowin \(2010\)](#) suggested that executives use the accruals method less often after SOX 2002, but this does not rule out the possibility that some executives are still using the accruals method. Similarly, [Graham et al. \(2005\)](#) suggested that executives, when given the opportunity to select the method of manipulation, would select the real activities method over the accruals method. Furthermore, [Zang \(2011\)](#) documented that executives prefer accrual manipulation over real activities when the cost of accruals is lower – for example, when tax payable is higher or when investors are watching closely. Our results do not indicate which methods are preferred by executives. These results may suggest that executives manipulate their financial reports using the real activities model, while at the end of the year they also manipulate their financial reports using accrual manipulation, if necessary. This researcher found that it was challenging to engage executives in research interviews, and it is clear from this work that which method is preferred remains a difficult question to answer without knowledge of the executives' motivations. Future research should use the qualitative method to investigate further which method is preferred.

TABLE 5.15. Descriptive statistics

MODEL	R-sq.
M2	0.48
M5	0.28
M1	0.48
M4	0.28
M3	0.47
M6	0.49
WCM	0.29
R1	0.43
R3	0.02
R2	0.96

TABLE 5.16. Empirical Findings			
hypotheses	Support hypotheses	Does not support hypotheses	consistencies and inconsistencies
H1: firms with innovation strategy have higher earnings management than non-innovated firms.	Support under R1, R2, R3, M1, M2, M3, AND M6 In summary: Real Activities model and balance sheet approach is Consistencies with the hypotheses	Does not support under M4, M5, and WCM In summary, Cash flow approach is inconsistencies with the hypotheses	Inconsistencies under M4, M5, and WCM with prior studies, the main reason is that the calculation of innovation under different studies. This PhD use no innovation for a firm with no innovation spending, other studies, used no innovation for low spending on innovations.
H2: There is a positive relationship between innovation strategy and accruals earnings management in developed economy firms	Support as there is a positive relationship between innovation strategy and accruals in margin earnings management in developed economies		consistencies with prior studies such as Shust (2015) and inconsistencies with prior studies such as (Jeppson and Nathan) as executives less concerned about higher and smooth earnings rather than spending on innovation
H3: There is a positive relationship between innovation strategy and accruals earnings management in	Support as there is a positive relationship between innovation strategy and accruals and margin		consistencies with prior studies such as Shust (2015) and inconsistencies with prior studies such as Jeppson and

developing economy firms.	earnings management in developing economies		Salerno) as executives less concerned about higher and smooth earnings rather than spending on innovation
H4: There is a positive relationship between innovation strategy accruals and earnings management level in transition economy firms.	Support under WCM as there is a positive relationship between innovation strategy and WCM in transition economies.	Does not support under accruals as a result indicates models are not statistically significant	inconsistencies with prior studies the as government-controlled the allocation of innovation and replaced it where it was essential to their power.t
H5: There is a negative relationship between innovation strategy and abnormal production, abnormal cash flow manipulation in developed economy firms.		Does not support the hypotheses as there was a positive relationship with abnormal cash flow and innovation in developed economy firms.	consistencies with prior studies such as Jeppson and Salerno
H6: There is a negative relationship between innovation strategy and abnormal production, abnormal cash flow manipulation in developing economy firms.		Does not support the hypotheses as there were a positive relationship with abnormal cash flow and innovation in developing economy firms	consistencies with prior studies such as Jeppson and Salerno
H7: There is a negative relationship between innovation strategy and		Does not support the hypotheses as there is no significant relationship between abnormal cash	There is no significant relationship

abnormal production, abnormal cash flow manipulation in transition economy firms.		flow and innovation in transition economy firms	
H8: There is a positives relationship between innovation strategy and abnormal discretionary expenses manipulation in developed economy firms.	Support as there is a positive relationship between innovation strategy and abnormal discretionary expenses manipulation in developed economy firms.		consistencies with prior studies such as (Roychowdhury, 2006)
H9: There is a positives relationship between innovation strategy and abnormal discretionary expenses manipulation in developing economy firms.	Support as there is a positive relationship between innovation strategy and abnormal discretionary expenses manipulation developing economy firms.		consistencies with prior studies such as Roychowdhury, 2006)
H10: There is a positives relationship between innovation strategy and abnormal discretionary expenses manipulation in transition economy firms.	Support as there is a positive relationship between innovation strategy and abnormal discretionary expenses manipulation in transition economy firms.		There is no significant relationship Roychowdhury, 2006)

H11: Firms focused on innovation strategy in are more likely to engage in earning management by utilising accruals methods in developed economies.		Does not support the hypotheses as there were no preferred method by executives in developed economy firms	consistencies with prior studies such as (Fields et al., 2001) and not consistencies with studies such as (Graham et al., 2005) this paper could not reach a firm decision as executives declined interviews.
H12: Firms focused on innovation strategy in are more likely to engage in earning management by utilising accruals methods in developing economies		Does not support the hypotheses as there were no preferred method by executives in developing economy firms	consistencies with prior studies such as Fields et al., 2001) and not consistencies with studies such as Graham et al., 2005)this paper could not reach a firm decision as executives declined interviews.
H13: Firms focused on innovation strategy in are more likely to engage in earning management by utilising accruals methods in transition economies		Does not support the hypotheses as there were no preferred method by executives in transition economy firms	consistencies with prior studies such as Fields et al., 2001) and not consistencies with studies such as Graham et al., 2005). this paper could not reach a firm decision as executives declined interviews.

5.12 Summary of Control Variables Results

With regard to the control variables, the tables 5.17, 5.18, and 5.19 presents the results of the linear regressions

Firm size results were statistically significant in developed, developing economies, and in transition economies. This study predicted no sign since larger firms might consider the manipulation of the financial reports, but also might not since their control system and qualified audit are higher than smaller firm size ([Warfield et al., 1995](#)) However, [Nelson et al. \(2002\)](#) argued that larger firms have more room to manipulate financial transaction than smaller firms. In all economies, there was a positive relationship between earnings management models and firms' size, but in abnormal cash flow, a negative relationship. This result is different to most of the studies ([Lee et al., 2006](#), [Shu and Chiang, 2014](#), [Ali et al., 2015](#)) as they indicated a positive relationship; the main difference in this paper and other studies is that they divided the firms into groups, large, mid-size and small firms. As a result, they examined the larger firms and found a positive relationship. In this paper, we examined all the firms with no categorisation in the firm size and found it is most significantly positive. The negative relationship in abnormal cash flow could be due to the fact that the focus of the model is on items and its relationship with cash. Financial leverage proves to be positively significant for economies. The positive t-statistics when presented indicate that the higher leverage is linked to the executives' incentives to have higher positive, this is consistent with prior studies such as ([Gunny, 2010](#), [Zang, 2012](#), [Popoola et al., 2016](#)) as they concluded that there are a relationship between leverage and earnings management.

The growth is highly positively significant in all models and developed and developing economies, while in transition economies significant but not under cash flow approach. The

overall results indicated that firms that selected innovation firms have higher profit which will result in growth, which is consistent with previous studies, such as [Matsumoto \(2002\)](#) who argued that executives in growth firms manipulate the financial reports in order to avoid income losses.

According to result, CFO, as predicated, is negatively significant, in all economies, but significantly positive in abnormal discretionary. The potential reason for that is the focus of the discretionary expenses model on items that impact the earnings directly and not cash flow. Performance results positively correlated with earnings management models in developed economies and developing economies balance sheet approach, but in the cash flow approach is a negative relationship and real activities models. In transition economies, there is no relationship. These results are consistent with [Chen et al. \(2012\)](#) results as indicating that the firms that reported losses negatively engaged less in manipulations, while those who reported positively engaged more in manipulations. Furthermore, these results are consistent with [Dechow et al. \(1998\)](#) who argued that higher cash flow is associated with better performance since real activities model tend to have lower cash flow, then a negative relationship exists.

In term of industrial, to measure the impact of industry, we run the regression models with and without industry code. The R2 result indicates that in developed economies, industrially made no change, while in developing economies, it increases the R2. In transition economies, the result, as shown in table (5-18) the R2 is lower. According to [Lee and Chou \(2020\)](#), some industrials that have higher competitions are more likely to engage in manipulations. In addition ([Dechow et al., 2010](#), [Gunny, 2010](#)) industrial competition encourage executives to manipulate financial statements. [Lee and Chou \(2020\)](#) study concluded that investors should consider the industrial effect on earnings management before investing to ensure protection of their capital.

	R1	R3	R2	WCM	M2	M5	M1	M4	M3	M6
INN	0.515*** (0.000)	0.686*** (0.000)	0.819*** (0.000)	0.650*** (0.000)	0.719*** (0.000)	0.454*** (0.000)	0.668*** (0.000)	0.408*** (0.000)	0.667*** (0.000)	0.382*** (0.000)
COF	-1.764*** (0.000)	0.547*** (0.000)	-0.100 (0.165)	-0.0974 (0.058)	0.0851 (0.080)	-0.827*** (0.000)	0.105* (0.022)	-0.787*** (0.000)	-0.0535 (0.233)	-1.759*** (0.000)
GRO	0.184*** (0.000)	0.103*** (0.000)	0.128*** (0.000)	0.124*** (0.000)	0.116*** (0.000)	0.165*** (0.000)	0.113*** (0.000)	0.161*** (0.000)	0.127*** (0.000)	0.180*** (0.000)
SIZE	-0.127*** (0.000)	0.0383** (0.006)	0.0958*** (0.000)	0.0190 (0.131)	0.0953*** (0.000)	0.0282 (0.051)	0.0954*** (0.000)	-0.0113 (0.403)	0.0834*** (0.000)	0.0370 (0.078)
LEV	0.283*** (0.000)	-0.0616 (0.150)	0.0665 (0.644)	0.261*** (0.000)	0.190*** (0.000)	0.568*** (0.000)	0.158*** (0.000)	0.531*** (0.000)	0.0398 (0.365)	0.198*** (0.001)
PERF	0.0213 (0.552)	-0.117*** (0.000)	-0.104 (0.111)	0.129*** (0.000)	0.0283 (0.346)	-0.0873* (0.026)	0.0386 (0.183)	-0.0629 (0.085)	0.101*** (0.001)	0.139*** (0.000)
INDU	0.00169 (0.161)	-0.00396*** (0.000)	-0.00760*** (0.000)	-0.00236** (0.008)	-0.00315*** (0.000)	0.000377 (0.713)	-0.00194* (0.016)	-0.000356 (0.716)	-0.00218* (0.016)	0.00204 (0.122)
_cons	-2.924*** (0.000)	-2.536*** (0.000)	-2.921*** (0.000)	-1.782*** (0.000)	-2.802*** (0.000)	-3.769*** (0.000)	-2.800*** (0.000)	-3.480*** (0.000)	-2.744*** (0.000)	-3.889*** (0.000)
N	9773	18778	4232	14438	15857	14039	16329	14427	14310	8422
R-sq	0.3556	0.3431	0.3933	0.2548	0.3328	0.2712	0.3100	0.2606	0.3413	0.3651

TABLE 5.17. Regression models in developing economies

	R1	R3	R2	WCM	M2	M5	M1	M4	M3	M6
INN	0.531*** (0.000)	15.55* (0.025)	1.161*** (0.000)	0.483*** (0.000)	0.601*** (0.000)	0.388*** (0.000)	0.555*** (0.000)	0.357*** (0.000)	0.610*** (0.000)	0.305** (0.006)
COF	-2.545*** (0.000)	0.803 (0.130)	-0.491*** (0.000)	-0.267*** (0.000)	-0.242*** (0.000)	-1.346*** (0.000)	-0.158* (0.014)	-1.364*** (0.000)	-0.290*** (0.000)	-2.476*** (0.000)
GRO	0.220*** (0.000)	0.0914** (0.010)	0.152*** (0.000)	0.144*** (0.000)	0.144*** (0.000)	0.199*** (0.000)	0.136*** (0.000)	0.196*** (0.000)	0.150*** (0.000)	0.209*** (0.000)
SIZE	-0.235*** (0.000)	0.586* (0.046)	0.0740* (0.015)	0.0568*** (0.000)	0.0810*** (0.000)	-0.0523** (0.003)	0.0794*** (0.000)	-0.0723*** (0.000)	0.0549*** (0.001)	-0.0204 (0.381)
LEV	0.0546 (0.298)	-0.480 (0.514)	-0.0888 (0.468)	0.242*** (0.000)	0.102* (0.016)	0.679*** (0.000)	0.119** (0.002)	0.638*** (0.000)	-0.107* (0.019)	0.00973 (0.872)
PERF	0.00508 (0.887)	-0.175 (0.763)	-0.132 (0.060)	0.0819* (0.012)	0.0884** (0.005)	-0.0639 (0.169)	0.0533 (0.089)	-0.0509 (0.249)	0.175*** (0.000)	0.116** (0.003)
INDU	-0.0000730 (0.950)	0.00860 (0.816)	-0.0116*** (0.000)	-0.00309*** (0.001)	-0.00486*** (0.000)	0.0000424 (0.970)	-0.00402*** (0.000)	-0.000136 (0.898)	-0.00370*** (0.000)	0.00130 (0.314)
_cons	-2.233*** (0.000)	-6.887** (0.003)	-2.695*** (0.000)	-1.910*** (0.000)	-2.688*** (0.000)	-3.191*** (0.000)	-2.647*** (0.000)	-3.032*** (0.000)	-2.560*** (0.000)	-3.469*** (0.000)
N	9145	80	3365	11188	12892	10409	13293	10685	11641	7375
R-sq	0.3106	0.5816	0.3213	0.1962	0.2488	0.2207	0.2339	0.2115	0.2501	0.3140

TABLE 5.18. Regression models in developing economies

	R1	R3	R2	WCM	M2	M5	M1	M4	M3	M6
INN	1.924 (0.202)	15.55* (0.025)	7.429* (0.046)	12.88** (0.002)	2.785 (0.452)	-1.776 (0.823)	3.476 (0.233)	-3.849 (0.630)	4.833 (0.176)	11.57 (0.271)
COF	-0.0893 (0.862)	0.803 (0.130)	-0.191 (0.709)	0.797* (0.039)	-0.772 (0.127)	0.444 (0.693)	-0.548 (0.276)	1.037 (0.356)	0.550 (0.295)	1.423 (0.648)
GRO	0.185*** (0.000)	0.0914** (0.010)	0.113** (0.002)	0.0602* (0.025)	0.179*** (0.000)	0.121 (0.110)	0.166*** (0.000)	0.0737 (0.333)	0.0916* (0.012)	0.0802 (0.255)
SIZE	-0.364 (0.259)	0.586* (0.046)	0.194 (0.278)	0.707** (0.003)	0.408 (0.067)	-0.0308 (0.886)	0.318 (0.107)	-0.142 (0.448)	0.317 (0.166)	0.852 (0.261)
LEV	-0.874 (0.215)	-0.480 (0.514)	-0.867 (0.495)	0.315 (0.542)	-0.510 (0.340)	0.510 (0.216)	-0.00678 (0.987)	0.501 (0.193)	-0.390 (0.483)	-1.350 (0.267)
PERF	-1.548 (0.085)	-0.175 (0.763)	-0.624 (0.401)	-0.504 (0.163)	-1.082 (0.054)	0.219 (0.580)	-0.613 (0.199)	0.195 (0.628)	-0.478 (0.273)	-0.742 (0.585)
INDU	0.0203 (0.748)	0.00860 (0.816)	0.0250 (0.156)	0.0769*** (0.000)	0.0417 (0.134)	-0.0128 (0.739)	0.0174 (0.631)	0.00681 (0.795)	-0.0000309 (0.999)	0.116 (0.097)
_cons	-1.693 (0.515)	-6.887** (0.003)	-3.230* (0.014)	-7.199*** (0.000)	-5.149** (0.004)	-3.748* (0.048)	-4.365** (0.008)	-3.248* (0.041)	-4.057* (0.027)	-11.25 (0.072)
N	32	80	20	60	52	65	53	64	47	18
R-sq	0.6449	0.5816	0.7950	0.6758	0.6152	0.5690	0.5710	0.5044	0.6659	0.5212

TABLE 5.19. Regression models in transition economies

5.13 OSL analysis without Robust

Test of regression assumptions indicated that the data suffer from linearity, autocorrelation, and heteroscedasticity. To solve the linearity, the researcher uses the transformation of the earnings management models. Also, to solve the autocorrelation and heteroscedasticity, we use a robust method. In this section, we ignored the autocorrelation and heteroscedasticity to investigate the results and compare them to the finding of this PhD. As presented in table 5.20, the coefficient results sign for innovation variables did not change, and the t values sign did not change, which support this research finding when utilising the Robust. The change of the coefficient and t values did not change much in values either.

TABLE 5.20. Regression with and without Robust.

	M4	M5	M6	M3	M1	M2	WCM
INN	0.408***	0.454***	0.382***	0.667***	0.668***	0.719***	0.650***
t	-7.19	-7.7	-5.67	-14.01	-14.53	-15.33	-13.84
Without	0.408***	0.454***	0.667***	0.667***	0.668***	0.719***	0.650***
t	-7.7	-8.29	-5.83	-14.74	-15.61	-16.77	-9.34
INN	0.408***	0.454***	0.382***	0.667***	0.668***	0.719***	0.650***
t	-7.19	-7.7	-5.67	-14.01	-14.53	-15.33	-13.84
Without	0.357***	0.388***	0.610***	0.610***	0.555***	0.601***	0.483***
t	-4.12	-4.33	-7.99	-7.99	-8	-8.54	-6.81
INN	-3.849	-1.776	11.57	4.833	3.476	2.785	12.88**
t	(-0.49)	(-0.23)	-1.17	-0.176	-1.21	-0.76	-3.19
Without	-3.849	-1.776	4.833	4.833	3.476	2.785	12.88*
t	(-0.52)	(-0.26)	-1.05	-1.05	-0.66	-0.53	-2.55
	R1			R3		R2	
INN	0.515***			0.686***		0.819***	
t	-9.47			-17.21		-10.5	
Without	0.515***			0.686***		0.819***	
t	-9.34			-15.86		-9.92	
INN	0.531***			0.618***		1.161***	
t	-6.31			-8.53		-9	
Without	0.531***			0.618***		1.161***	
t	-7.25			-8.25		-9.26	
INN	1.924			15.55*		7.429*	
t	-1.31			-2.29		-2.23	
Without	1.924			15.55*		7.429	
t	-1.05			-2.37		-1.84	

5.14 Chapter Summary

In this chapter, various tests were employed in order to investigate the research hypotheses. This chapter provides the results of the descriptive analysis, which was utilised in order to examine the research hypotheses. The research hypotheses predicted that firms with innovation strategies have higher earnings management than firms with no innovation strategy. Also, the research predicted that there is a positive relationship between innovation and accruals manipulation and negative relationship between real activities, abnormal production and abnormal cash flow manipulation and innovation. Also, predicted a positive relationship between earnings management discretionary expenses and innovation. The results of descriptive analysis and regressions do, in general, support this research's hypotheses. In other words, the non-innovated firms do not have higher earnings management than innovated firms in most of earnings management models, and the innovated firms manipulate the financial statements not in the same percentage as non-innovated firms. In addition, accruals manipulation and working capital models in developed economies and developing economies have a positive relationship with innovation. Which means that innovated firms that use accruals earnings management do not reduce spending on innovation. Furthermore, innovated firms that used real activities also do not reduce spending on innovation.

In accruals relationship with innovation, the developed and developing economies have a positive relationship, which supports the research hypotheses that executives' firms managed the financial reports using the accruals method to support innovation strategies. In transition economies, only one model, the working capital model, has a significant positive relationship, and other accruals models have no relationship. Also, we predicated that executives' firms that utilise real approach do cut innovation strategies. The result in innovation firms suggests that executives do not reduce the spending in innovation rather than support innovation. Lastly, we examine the preferred method for executives, and our analysis indicates that we

could not come to the concluded result and we firmly believe that executives utilise both approaches at the same time with no preferences.

5.15 Additional Analysis

5.15.1 An Alternative Measurement of innovation and earnings management.

Executives' motivations to reduce and increase innovations are documented by prior research, such as ([Oswald and Zarowin, 2007](#)). One can argue that the prime reason for reducing innovation is meeting earning targets ([Roychowdhury, 2006](#)). This PhD research investigated whether the firms increase or decrease innovations to meet earnings in developing, developed and transition economies. To do so, the researcher used distance measurement ([Oswald and Zarowin, 2007](#)) to identify the earnings incentives during the year. The researcher classified firms into three groups, as follows:

- Smoothing: firms would make earnings target even with an increase in innovation. Therefore, their incentives might be to increase innovation in the current year as they are already meeting their goals and will reduce innovation in the following year.
- Big bath: firms would miss earnings goals even with decreased innovation. Therefore, their incentives are to increase innovation for the current year in order to reduce innovation expenditure in the following year. Since manipulation of the financial reports upward will not allow the firms to reach their earnings target, executives' incentives are to make the earnings worse. Firms in this group attend to restructure their business and incur more expenditure, such as spending on innovation. According to [Nieken and Sliwka \(2015\)](#) executives that are ready to leave firms use earnings

management to the max, while the new executives do the same in order to claim fewer expenditures for the following periods. [Jordan and Clark \(2004\)](#) argued that executives would incur more losses in one year so that there are better future earnings in a condition where is no or little impact on firms' or executives' reputations. [Cameron and Stephens \(1991\)](#) provided supporting shreds of evidence on the big bath theory, while [Yoon and Miller \(2002\)](#) documented that executives in Korean industrial firms tend to increase losses when performance is reduced. According to [Kirschenheiter and Melumad \(2002\)](#), firms with unusual low earnings in the year take massive write-downs to decrease earnings further.

- Meet: firms that would miss earnings goal without decreasing the innovation. Therefore, their incentives could be to decrease innovation to meet the earnings target for the year. [Roychowdhury \(2006\)](#) documented strong evidence on US firms in 36 industries that executives reduce innovation to meet current earnings. Similarly, [Osma and Young \(2009\)](#) found evidence in UK firms for the period between 1989 and 2002 that firms decrease innovation to avoid reporting losses.

To calculate the distance measurement, the researcher employed the following:

Distance Innovation = ((current income before tax – innovation expenditure in current year) – prior income before tax – innovation expenditure in prior year)) / prior innovation expenditure

The researcher assumes that, for group one, if the distance is between nil and -.25, then the firms could cut enough innovation to meet earnings goals. For group two, if the distance is less than -0.25, then the firms could not feasibly cut innovation enough to meet earnings goals; and, lastly, for group three, if the distance is more significant than nil, then firms can increase innovation and meet their earnings target too.

Table 5.21 shows that the results indicated that 39.5% of firms in all samples increase their innovation expenditure in the year to decrease it in the following years since they have met their earnings target. 40% decrease their earnings to meet their earnings, and only around 4% increase their earnings as they decrease of earnings will not allow them to reach the yearly earnings.

In developed economies and transition economies, the result is consistency with all sample. The results also indicate that around 42% of the firms in developed economies, 38% of the firms in developing economies increase their innovation since they already met the target earnings and increasing innovation would result help the executives in the following years to report lower innovation expenditures. Also, the results indicated that around 39% in developed economies and around 40% in developing economies decrease their innovation to meet earning for the current year. Around 5% in developed economies and 3% in developing economies increase their innovation as the reduction will not be helpful to achieve their incentives of meeting earnings. in transition economies, the result was different as 46% firms increase their innovation as the decrease will not be beneficial, and around 31% increase their earnings since they achieve their target. Lastly, around 22% of the firms decrease their earnings to meet current earnings. These results show that most executives manipulate innovation to down earnings and smooth earnings. According to [Hunt et al. \(2000\)](#), firms with poor performance utilise smoothing earnings manipulation in order to increase their gains. Similarly, [Bernstein \(1993\)](#) argued that smoothing earnings is used to transfer wealth from shareholders to executives. [Chaney and Lewis \(1995\)](#) documented that the executives' smooth earnings to convey private information.

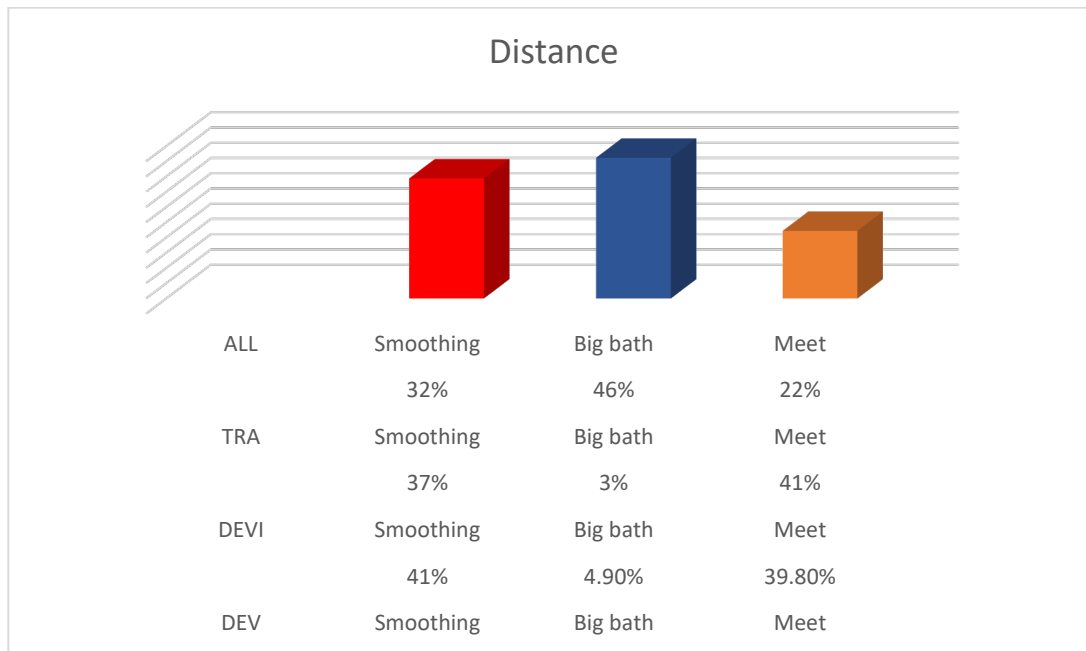
Overall, the results indicate that there is considered strong evidence that executives manipulate innovation in order to achieve specific incentives, suggesting executives in firms increase their

innovation in a specific year to decrease the firms' expenditure in the following years. In the same direction, executives increase the spending on innovation as the manipulation of accruals will not allow them to reach the earnings target; therefore, they increase spending. Lastly, less than 44% of the result suggests that firm increase their innovation to meet current earnings. These results support the main finding as accruals manipulation was reported positively with earnings management models, and the real activities reported positively, which aligns with the decrease in innovation. [Grabińska and Grabiński \(2018\)](#) study provides sharp pieces of evidence on the relationship between innovation and executives. The study documented that executives support innovation project with a high cost as they become emotionally committed to the project.

TABLE 5.21. Distance innovation measurement.

DEVELOPED	Smoothing	Big bath	Meet
	0.41	0.049	0.398
DEVELOPING	Smoothing	Big bath	Meet
	0.37	0.03	0.41
TRANSACTION	Smoothing	Big bath	Meet
	0.32	0.46	0.22
ALL SAMPLE	Smoothing	Big bath	Meet
	0.394	0.462	0.222

FIGURE 5.10. Summary of motivation percentage



Similarly, earnings management motivations, as represented in Chapter 2, are different in different situations and times. This researcher captured three significant classifications of earnings management behaviours: firms utilised earnings manipulation to increase earnings; firms utilised earnings managements to decrease earnings; and firms with no or little earnings manipulations.

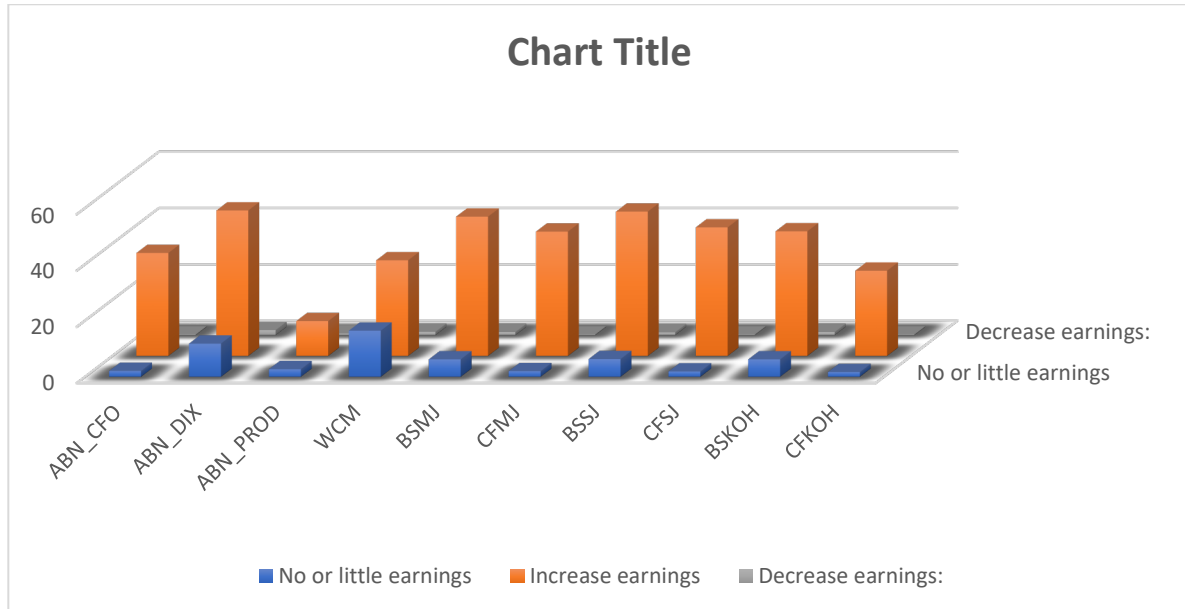
The researcher classified earnings management into three groups, as follows:

- Increase earnings: firms with significant income-increasing, positive results.
- Decrease earnings: firms with significant income-decreasing, negative result.
- No or little earnings: with little or no earnings management, close to zero.

According to figure 5.10, the results indicate that the firms are motivated to increase earnings in all models in different percentages. Which align with this PhD finding since innovation

requires finding, executives may be engaged in accruals to support innovation and engaged in real activities to increase earnings upward.

FIGURES 5.11. Earnings management motivation.



6. Chapter Six: Conclusion

6.1 Conclusion

In order to achieve the objective of this study, this research evaluated the most popular earnings management models to determine whether earnings management strategies impact innovation funding in firms. The models examined were the standard Jones, modified Jones, Kothari, and working capital and real activities models that included abnormal cash flow, abnormal production, and abnormal discretionary expenses. Among all the earnings management models used to estimate earnings management for this research sample, the Kothari model provided higher R², which indicates that this model is the best fit among all of the accruals models; this means that including control variables and firm performance enhances the accruals models. We do not take from these findings that the Kothari model is the most suitable measurement under discretionary accruals, simply because the measurements under the cash flow approach for the same model provided a different result. However, if we ignore the consequences of discretionary calculations, it could be argued that the Kothari model is superior to the other models. Nevertheless, the elimination of a method of calculation of accruals in from the Kothari model might mislead researchers to overestimate the power of the Kothari model. Further to this, Kothari tested his model using a cross-sectional approach, but our research employed a time-series panel, which may not be appropriate for the Kothari model.

In our study, the Jones and modified Jones models were shown to be the most popular choices for estimating discretionary accruals, even though prior scholars have indicated that both the standard Jones and modified Jones models are not the best fit for discretionary accruals.

In calculating the accruals, we utilised the balance sheet and cash flow approach. [Hribar and Collins \(2002\)](#) argued that events could impact accruals that were calculated using a balance sheet. In fact, in mergers and acquisitions, when firms – specifically large firms – merge, an increase in accounts receivables is often seen. In our study, the choice to use balance sheet accruals was due to the availability of sample data for 2010 to 2018. To determine whether the balance sheet calculations had an impact on our results, we replicated the calculation using a cash flow statement to generate our total accruals.

Surprisingly, no significant difference was found between the standard Jones and modified Jones models, which indicates that firm executives may not take full advantage of accounts receivable. Most researchers prefer to use modified Jones over standard Jones, but the current results indicate that both models are useful in deducing earnings management. We have also noticed that some researchers substitute a zero value for missing values in accounts receivable, while others used different approaches, including maximum likelihood and multiple imputations, which can introduce bias into their results and may, therefore, explain their outcomes. In this study, we omitted all firms that had missing or zero accounts receivable. While we acknowledge that statistics allow researchers to use different methods, the missing data from accounts receivable is not a factor that can be ignored or adjusted for, because accounts receivable is the main difference in both models.

This difference in approach led us to significant differences in our results, depending on the method we used. [Solan \(1996\)](#) documented the advantages of using the cash flow approach; from an accounting perspective, accruals are economic benefits that use economic efforts to report performance, and therefore, accruals are designed to save time. The calculation of cash flow approach, however, is based on the cash flow from operating activities, which can be adjusted with other comprehensive income modifications; when this happens, it is likely to enhance the result. Furthermore, while changes in equity items impact income statements

rather than balance sheets, due to time constraints and limited research scope, we conclude in this research that the different methods of calculating accruals affect the earnings management models. Future thorough analysis, therefore, is required to explore this issue further.

The hypotheses of the current work predicted that innovated firms would have lower earnings management than non-innovated firms. Innovation literature suggests that innovated firms have higher levels of earnings manipulation than non-innovated firms and argues that firms with innovation require consistent funding, and since it is challenging to obtain outside funding, executives use earnings management in order to support innovation in these firms. These challenges are not as evident in non-innovated firms; therefore, an innovated firm's executives experience more significant levels of pressure. The results of the analysis employed in this research indicate that innovated firms have higher mean values compared to non-innovated firms in real activities models and accruals models under the balance sheet approach, which aligns with our predictions and the findings of other studies. Under the cash flow approach and WCM, however, non-innovated firms have higher mean values than innovated firms. This is likely due to the way other research identified and analysed innovation. We categorized innovated firms based on the existence of innovation in a firm where other studies categorized them based on the value of the innovation, which explains why these studies may have arrived at inaccurate conclusions. For example, a firm with an insufficient funding for innovation may still be an innovated firm, because company size and industry must be considered before the firm is ruled out as non-innovated. Furthermore, there might be a reduction of innovation due to economic performance or business performance in some years but not in others.

This research provides an unbiased opinion, and therefore, the cash flow approach should not be ruled out. A proper explanation of this result is that executives at innovated firms and non-innovated firms are more concerned about earnings and keeping stakeholders happy.

Moreover, the benefits of innovation are not immediate, and therefore, it may be less likely to be supported by executives who are under pressure to meet current earnings.

The research hypotheses also predicted that innovated firms would have a positive relationship with accrual manipulation and that spending on innovation would provide an advantage to firms. For example, innovated firms stand to gain from tax credits for innovation, reasons for not meeting earnings targets and the future benefits of innovation. Our results support these hypotheses. The findings show that executives may engage in manipulating financial statements using accrual manipulation, but they also support innovation over meeting other goals such as current earnings. Furthermore, IFRS permits firms to capitalise on future innovation expenditures, which might provide executives with more motivation to fund innovation projects. Finally, the value of innovated firms is higher due to the future economic benefits of successful innovation.

In another hypothesis, we predicted that innovated firms would have a negative relationship with abnormal cash flow and abnormal production and a positive relationship with abnormal discretionary expenses. With regard to abnormal activities, prior scholars documented the impact of abnormality on cash flow. As producing more goods will lower the overall cost of goods, it affects cash flow, since more is being produced than is being sold. Along the same lines, while providing more discounts will encourage sales, the discount percentage and customer credit may lower cash flow availability. Since these activities can lower cash flow, they may result in less access to cash for innovation. The hypotheses of the current research argued that executives would engage in abnormal activities less often in order to support innovation. The findings revealed a positive relationship between earnings management and abnormal activities. We also argued that the engagement of executives in overproduction or acceleration of sales does not impact the funding of innovation. It is likely that, as we have documented here, executives employed accruals techniques that supported abnormal activities

manipulation. While we also argued that lower levels of cash flow as a result of overproduction might be offset through discount sales, and the decrease of sales might not be large enough to impact future economic benefits, the research revealed a positive relationship between abnormal discretionary expenses and innovated strategy. Prior research also indicated that reducing expenses through the decisions of executives increases net income, but the current study argues that decreasing items such as marketing expenditures or administration expenditures results in higher cash availability for funding innovation.

The hypotheses for this paper further predicted that executives of innovated firms would be more likely to engage in discretionary accruals than in abnormal activities. Our results indicated otherwise. Discretionary accruals are used more with abnormal production and abnormal cash flow, but less with discretionary accruals cash flow, abnormal discretionary expenses, and WCM. We argue that R2 is not the best method to determine executives' levels of engagement in earnings management. Considering for many reasons, the evaluation of abnormal activities is affected by the omission of other variables, such as economic performance and business performance. In addition, abnormal change results can be misleading, as what is considered as abnormal could include normal strategic business decisions that most executives engage in. For example, the acceleration of sales might be purely based on a strategic decision to increase market share or increase sales of a specific product. Accruals also suffer from the method of calculation. Since these results did not support our hypothesis, we argue it is very challenging to determine the preferred method without considering the executives' motivation and the tree of investment decisions. Therefore, this paper cannot uncover which method is preferred, and it remains a difficult problem that necessitates future investigation, using both qualitative and quantitative methods.

With respect to earnings management, one surprising result was that there was no difference found between developed economies, developing economies and economies in transition. This

was different from other studies which indicated that culture and region might impact earnings management levels. This study's findings may suggest that executives in developed and developing economies and transition economies have comparable motivations, and despite differences in region, culture and time, executives might manipulate financial statements in each economy similarly, as the mean values of earnings management indicated that there are no significant differences between economies. While other studies have shown that religion and culture affect the level of earnings, we argue that it is very challenging to evaluate executives' decisions for each society to determine whether their decisions were based on religion and cultural values or on specific motivations.

With respect to all of the hypotheses, the developed and developing economies were comparable in the relationship between earnings management and innovation strategies. The findings suggest that executives who engaged in accrual and real activities manipulation do support innovation and executives in developed and developing economies, in general, have similar attitudes toward innovation. For example, firms in the developed economies of the United Arab Emirates and Qatar fund innovation extremely, as is done in developed countries such as the United States and United Kingdom. The different results for transition economies suggest that executives likely behave differently toward innovation strategies than in developed and developing economies, which could be due to limitations to innovation as well as the political structures in transition economy countries. The difference may also have been caused, however, by the number of observations in the transition economy.

While our results indicated a positive relationship between accrual manipulation and real activities manipulation, most, but not all, of the prior studies indicated otherwise. Our findings suggest that executives employ both manipulations aggressively and simultaneously to maximise their outcomes.

6.2 Research Limitations and Future Study

This research presented had some limitations and presented some opportunities for future research, which are addressed below:

- Sample size for the transition economies: The number of firms used for transition economies in this analysis only accounted for 7% of the firms included in the analysis, while those from developed economies accounted for 37.2% and firms from developing economies made up 62%. As a result, it was challenging to find significant relationships from the transition economy data.
- Access to patent information: Patent information is under-reported due to limitations of standards such as, for example, IAS 38. Since enquiries regarding patent information are not accepted, it is difficult to assess this essential aspect of innovation.
- Interviews: Due to the sensitivity of the study topic, not all of the firm executives responded to requests for interviews to assess their innovation choices. This limited the research, requiring the use of a solely quantitative approach rather than mixed, which could have provided a more in-depth analysis on executives' preferences regarding earnings management. Moreover, executive interviews also provide greater insight into executives' motivations and provide researchers with the opportunity to identify the motivations in developed, developing and transition economies and determine whether they differ.
- Extracting the financial data: Not all data were available through the database. Instead, this researcher collected missing data from SDER and the firms' annual financial statements, which took longer. It is recommended that policymakers take action to reduce this behaviour, as the more information firms provide, the clearer the picture researchers can glean from the data.

- Prior research: There are few prior pieces of research on calculating total accruals in earnings management using both approaches. Furthermore, there is no research that discusses it in-depth, especially with regard to IFRS changes. This led to some conflict in findings between both methods. Future research should focus on calculating accruals using both methods, and more research should be conducted to determine the most appropriate method.
- Impact of business cycles and economic crises on earnings management results: Abnormal activities may change based on the economic situation in a specific country; for example, the real estate market in Canada, Australia and the United Kingdom grew between 2014 and 2018, which increased abnormal activities in this area. Another example to consider is that COVID-19 has caused increases in the demand for healthcare products, which will result in higher levels of abnormal sales for 2020. These abnormal sales would not have been caused by firm manipulation, but outside circumstances, and to consider the findings to be the result of manipulation would provide misleading information to stakeholders. Furthermore, the restructuring of firms and changes in the business environment or business activities can have an effect. This research asserts that economic factors and other factors should be given more consideration, specifically with regard to abnormal activities models, when earnings management is being investigated. Future research should examine abnormal models and attempt to improve them.

6.3 Contribution to Knowledge

Several contributions are made by this PhD research, which are summarised as follows:

- To the knowledge of the researcher, this research is one of the first studies to classify and employ economic demographics to examine innovation strategies in developed, developing and transition economies. Prior research has only focused on specific countries, and by categorising the countries by their economic power, this researcher provides essential evidence on the similarity of firms in each economy.
- To the best of our knowledge, this study is the first to have used all categories of the Global Industry Classification Standard, as prior research only used the industrial or financial industries for the study of earnings management. This research also included more classifications, which provides a broader view of earnings management.
- This research is only one of a few studies that examines innovation strategy using real activities manipulation and accrual manipulation. The majority of the previous studies were conducted using accrual manipulation.
- Finally, this research is one of a few studies that calculates total accruals using both cash flow and balance sheets and examines the relationship between accruals and investment in innovation strategies. However, our results provide a different point of view regarding the outcomes for each method and emphasise the need for updating current methods, especially considering the change in GAAP standards.

5. References

- Abarbanell, J. S. and Lehavy, R. (2003) 'Biased Forecasts or Biased Earnings? The Role of Reported Earnings in Explaining Apparent Bias and Over/Underreaction in Analysts' Earnings Forecasts', *SSRN Electronic Journal*. doi: 10.2139/ssrn.232453
- Aboudy, D. and Lev, B. (2000) 'Information Asymmetry, R&D, and Insider Gains', *The Journal of Finance*, 55(6), pp. 2747-2766. doi: 10.1111/0022-1082.00305
- Abou-Moghli, A. A., Al Abdallah, G. M. and Al Muala, A. (2012) 'Impact of innovation on realizing competitive advantage in banking sector in Jordan', *American Academic & Scholarly Research Journal*, 4(5), pp. 1. doi:
- Abou Hana, M. (2017) 'Innovation in the UAE: from first foundations to 'beyond oil'', *Global Policy*, 8(3), pp. 414-417. doi:
- Adkins, L. C. 2011. Using gretl for Monte Carlo experiments. JSTOR.
- Adut, D., Holder, A. D. and Robin, A. (2013) 'Predictive versus opportunistic earnings management, executive compensation, and firm performance', *Journal of Accounting and Public Policy*, 32(3), pp. 126-146. doi: 10.1016/j.jaccpubpol.2013.02.007
- Ahmed, S. (2013) 'Measuring quality of reported earnings' response to corporate governance reforms in Russia', *Journal of Accounting in Emerging Economies*, 3(1), pp. 21-46. doi: 10.1108/20440831311287682
- Al-Abd, Y., Mezher, T. and Al-Saleh, Y. 'Toward building a national innovation system in UAE'. *2012 Proceedings of PICMET'12: Technology Management for Emerging Technologies*: IEEE, 2086-2099.
- Al-Amri, K., Al Shidi, S., Al Busaidi, M. and Akguc, S. (2017) 'Real earnings management in public vs private firms in the GCC countries: a risk perspective', *Journal of Applied Accounting Research*. doi:
- Al-Fayoumi, N., Abuzayed, B. and Alexander, D. (2010) 'Ownership structure and earnings management in emerging markets: The case of Jordan', *International Research Journal of Finance and Economics*, 38(1), pp. 28-47. doi:
- Al-Khouri, A. M. (2012) 'eGovernment strategies the case of the United Arab Emirates (UAE)', *European Journal of ePractice*, 17(September), pp. 126-150. doi:
- Al-Shattarat, B. (2017) *Real earnings management activities, meeting earnings benchmarks and future performance: UK evidence*. University of Plymouth.
- Al-Najjar, B. (2010) 'Corporate governance and institutional ownership: evidence from Jordan', *Corporate Governance: The international journal of business in society*, 10(2), pp. 176-190. doi: 10.1108/14720701011035693
- Alabdullah, T. T. Y. (2016) 'Are Board Size And Ownership Structure Beneficial In Emerging Markets' Firms? Evidence From Jordan', *International Journal of Management & Information Systems (IJMIS)*, 20(3), pp. 87-94. doi: 10.19030/ijmis.v20i3.9752
- Alareeni, B. (2018) 'The impact of firm-specific characteristics on earnings management: evidence from GCC countries', *International Journal of Managerial and Financial Accounting*, 10(2), pp. 85. doi: 10.1504/ijmfa.2018.091659
- ALGHAMDI, S. and Ali, L. (2012) *Investigation into earnings management practices and the role of corporate governance and external audit in emerging markets: Empirical evidence from Saudi listed companies*. Durham University.
- Ali, U., Noor, M., Khurshid, M. K. and Mahmood, A. (2015) 'Impact of firm size on earnings management: A study of textile sector of Pakistan', *European Journal of Business and Management*, 7(28). doi:
- Alin, A. (2010) 'Multicollinearity', *Wiley Interdisciplinary Reviews: Computational Statistics*, 2(3), pp. 370-374. doi: 10.1002/wics.84

- Almasarwah, A. K. (2015) *Earnings management and its relationship with corporate governance mechanisms in Jordanian industrial firms*. Loughborough University.
- Alzoubi, E. S. S. (2016) 'Ownership structure and earnings management: evidence from Jordan', *International Journal of Accounting & Information Management*. doi:
- Alzurqan, S. T. and Al_Sufy, F. J. (2011) 'The effect of corporate governance on the performance of Jordanian industrial companies: An empirical study on Amman Stock Exchange', *International Journal of Humanities and Social Science*, pp. 55-69. doi:
- Amin, M., Rezaei, S. and Tavana, F. S. (2015) 'Gender differences and consumer's repurchase intention: the impact of trust propensity, usefulness and ease of use for implication of innovative online retail', *International Journal of Innovation and Learning*, 17(2), pp. 217. doi: 10.1504/ijil.2015.067409
- Arifin, T. and Kusuma, I. (2011) 'Comparing Earnings Management in Germany and the USA', *International Journal of Management and Business Research*, 1(2), pp. 59-68. doi:
- Armstrong, M. B. (1993) 'Ethics and professionalism in accounting education: A sample course', *Journal of Accounting Education*, 11(1), pp. 77-92. doi: 10.1016/0748-5751(93)90019-f
- Arundel, A., Casali, L. and Hollanders, H. (2015) 'How European public sector agencies innovate: The use of bottom-up, policy-dependent and knowledge-scanning innovation methods', *Research Policy*, 44(7), pp. 1271-1282. doi: 10.1016/j.respol.2015.04.007
- Arya, A., Glover, J. C. and Sunder, S. (2003) 'Are Unmanaged Earnings Always Better for Shareholders?', *Accounting Horizons*, 17(s-1), pp. 111-116. doi: 10.2308/acch.2003.17.s-1.111
- Autor, D., Dorn, D., Hanson, G., Pisano, G. and Shu, P. (2016) *Foreign Competition and Domestic Innovation: Evidence from U.S. Patents*: National Bureau of Economic Research. Available at: <http://dx.doi.org/10.3386/w22879>.
- Avramidis, E. and Smith, B. (1999) 'An introduction to the major research paradigms and their methodological implications for special needs research', *Emotional and behavioural difficulties*, 4(3), pp. 27-36. doi:
- Babbie, E. and Mouton, J. (2001) 'The practice of social research. Cape Town: Oxford University Press. Available in url: http', *sholar. google. co. za*. Accessed on, 15(06), pp. 2010. doi:
- Baber, W. R., Fairfield, P. M. and Haggard, J. A. (1991) 'The effect of concern about reported income on discretionary spending decisions: The case of research and development', *Accounting Review*, pp. 818-829. doi:
- Bajra, U. and Cadez, S. (2018) 'The impact of corporate governance quality on earnings management: Evidence from European companies cross-listed in the US', *Australian Accounting Review*, 28(2), pp. 152-166. doi:
- Baldwin, J., Hanel, P. and Sabourin, D. 2002. Determinants of Innovative Activity in Canadian Manufacturing Firms. *Innovation and Firm Performance*. Palgrave Macmillan UK.
- Bange, M. M. and De Bondt, W. F. M. (1998) 'R&D budgets and corporate earnings targets', *Journal of Corporate Finance*, 4(2), pp. 153-184. doi: 10.1016/s0929-1199(98)00006-6
- Barbaroux, P. (2014) 'From market failures to market opportunities: managing innovation under asymmetric information', *Journal of Innovation and Entrepreneurship*, 3(1), pp. 5. doi: 10.1186/2192-5372-3-5
- Barnes, B. (1982) *T-S-Kuhn and Social Science*. Macmillan International Higher Education.
- Barth, M. E., Beaver, W. H., Hand, J. R. and Landsman, W. R. (2005) 'Accruals, accounting-based valuation models, and the prediction of equity values', *Journal of Accounting, Auditing & Finance*, 20(4), pp. 311-345. doi:

- Barth, M. E., Beaver, W. H. and Landsman, W. R. (2001) 'The relevance of the value relevance literature for financial accounting standard setting: another view', *Journal of Accounting and Economics*, 31(1-3), pp. 77-104. doi: 10.1016/s0165-4101(01)00019-2
- Bartov, E. (1993) 'The timing of asset sales and earnings manipulation', *Accounting Review*, pp. 840-855. doi:
- Bartov, E., Givoly, D. and Hayn, C. (2002) 'The rewards to meeting or beating earnings expectations', *Journal of Accounting and Economics*, 33(2), pp. 173-204. doi: 10.1016/s0165-4101(02)00045-9
- Bartov, E., Gul, F. A. and Tsui, J. S. L. (2000) 'Discretionary-accruals models and audit qualifications', *Journal of Accounting and Economics*, 30(3), pp. 421-452. doi: 10.1016/s0165-4101(01)00015-5
- Bartz-Zuccala, W., Mohnen, P. and Schweiger, H. (2018) 'The role of innovation and management practices in determining firm productivity', *Comparative Economic Studies*, 60(4), pp. 502-530. doi:
- Barua, A., Lin, S. and Sbaraglia, A. M. (2010) 'Earnings Management Using Discontinued Operations', *The Accounting Review*, 85(5), pp. 1485-1509. doi: 10.2308/accr.2010.85.5.1485
- Bates, R. and Khasawneh, S. (2004) 'Organizational Learning Culture, Transfer Climate and Perceived Innovation in Jordan', *Online Submission*. doi:
- Beatty, A. L., Ke, B. and Petroni, K. R. (2002) 'Earnings management to avoid earnings declines across publicly and privately held banks', *The accounting review*, 77(3), pp. 547-570. doi:
- Beaver, W. H., McNichols, M. F. and Nelson, K. K. (2003) 'Management of the loss reserve accrual and the distribution of earnings in the property-casualty insurance industry', *Journal of Accounting and Economics*, 35(3), pp. 347-376. doi: 10.1016/s0165-4101(03)00037-5
- Becker, C. L., Defond, M. L., Jiambalvo, J. and Subramanyam, K. R. (1998) 'The Effect of Audit Quality on Earnings Management', *Contemporary Accounting Research*, 15(1), pp. 1-24. doi: 10.1111/j.1911-3846.1998.tb00547.x
- Beneish, M. D. (2001) 'Earnings management: A perspective', *Available at SSRN 269625*. doi:
- Benkel, M., Mather, P. and Ramsay, A. (2006) 'The association between corporate governance and earnings management: The role of independent directors', *Corporate Ownership & Control*, 3(4), pp. 65-75. doi:
- Bens, D. A., Nagar, V., Skinner, D. J. and Wong, M. F. (2003) 'Employee stock options, EPS dilution, and stock repurchases', *Journal of Accounting and Economics*, 36(1-3), pp. 51-90. doi:
- Bereskin, F. L., Hsu, P.-H. and Rotenberg, W. (2018) 'The Real Effects of Real Earnings Management: Evidence from Innovation', *Contemporary Accounting Research*, 35(1), pp. 525-557. doi: 10.1111/1911-3846.12376
- Bergstresser, D. and Philippon, T. (2006) 'CEO incentives and earnings management', *Journal of Financial Economics*, 80(3), pp. 511-529. doi: 10.1016/j.jfineco.2004.10.011
- Bernstein, R. (1993) 'The earnings expectations life cycle', *Financial Analysts Journal*, 49(2), pp. 90-93. doi:
- Berry, W. 1993. Understanding Regression Assumptions. SAGE Publications, Inc.
- Bešlić, I., Bešlić, D., Jakšić, D. and Andrić, M. (2015) 'Testing the models for detection of earnings management', *Industrija*, 43(3), pp. 55-79. doi:
- Bhuiyan, M. B. U., Roudaki, J. and Clark, M. (2013) 'Corporate Governance Compliance and Discretionary Accruals: New Zealand Evidence', *Australasian Accounting, Business and Finance Journal*, 7(2), pp. 101-124. doi: 10.14453/aabfj.v7i2.7

- Black, E. L., Sellers, K. F. and Manly, T. S. (1998) 'Earnings Management Using Asset Sales: An International Study of Countries Allowing Noncurrent Asset Revaluation', *Journal of Business Finance & Accounting*, 25(9-10), pp. 1287-1317. doi: 10.1111/1468-5957.00238
- Blaikie, N. (2000) 'Designing social research. Cambridge', *Polity*. doi:
- Bonacchi, M., Marra, A. and Zarowin, P. (2019) 'Organizational structure and earnings quality of private and public firms', *Review of Accounting Studies*, 24(3), pp. 1066-1113. doi: 10.1007/s11142-019-09495-y
- Boone, J. P., Khurana, I. K. and Raman, K. K. (2010) 'Do the Big 4 and the Second-tier firms provide audits of similar quality?', *Journal of Accounting and Public Policy*, 29(4), pp. 330-352. doi: 10.1016/j.jaccpubpol.2010.06.007
- Bound, J., Cummins, C., Griliches, Z., Hall, B. and Jaffe, A. (1982) *Who Does R&D and Who Patents?* : National Bureau of Economic Research. Available at: <http://dx.doi.org/10.3386/w0908>.
- Bourdieu, P. (1977) 'The economics of linguistic exchanges', *Information (International Social Science Council)*, 16(6), pp. 645-668. doi:
- Braam, G., Nandy, M., Weitzel, U. and Lodh, S. (2015) 'Accrual-based and real earnings management and political connections', *The International Journal of Accounting*, 50(2), pp. 111-141. doi: 10.1016/j.intacc.2013.10.009
- Brown, J. R., Fazzari, S. M. and Petersen, B. C. (2009) 'Financing Innovation and Growth: Cash Flow, External Equity, and the 1990s R&D Boom', *The Journal of Finance*, 64(1), pp. 151-185. doi: 10.1111/j.1540-6261.2008.01431.x
- Brown, J. R., Martinsson, G. and Petersen, B. C. (2012) 'Do financing constraints matter for R&D?', *European Economic Review*, 56(8), pp. 1512-1529. doi: 10.1016/j.euroecorev.2012.07.007
- Brown, L. D. (2001) 'A Temporal Analysis of Earnings Surprises: Profits versus Losses', *Journal of Accounting Research*, 39(2), pp. 221-241. doi: 10.1111/1475-679x.00010
- Bryman, A. (2008) 'Of methods and methodology', *Qualitative Research in Organizations and Management: An International Journal*, 3(2), pp. 159-168. doi: 10.1108/17465640810900568
- Budrina, M. (2014) 'The Impact of IFRS Adoption on Accrual-Based Earnings Management: Evidence from Russia', *University of OULU*. doi:
- Burgstahler, D. (1997) 'Incentives to manage earnings to avoid earnings decreases and losses: Evidence from quarterly earnings', *Available at SSRN 30240*. doi:
- Burgstahler, D. and Dichev, I. (1997) 'Earnings management to avoid earnings decreases and losses', *Journal of Accounting and Economics*, 24(1), pp. 99-126. doi: 10.1016/s0165-4101(97)00017-7
- Burnett, B. M., Gordon, E. A., Jorgensen, B. N. and Linthicum, C. L. (2015) 'Earnings Quality: Evidence from Canadian Firms' Choice between IFRS and U.S. GAAP', *Accounting Perspectives*, 14(3), pp. 212-249. doi: 10.1111/1911-3838.12051
- Burrell, G. Morgan, 1979. *Sociological Paradigms and Organizational Analysis: Elements of the Sociology of Corporate Life*. London: Heineman.
- Bushee, B. J. (1998) 'Institutional investors, long-term investment, and earnings management', *Long-term Investment, And Earnings Management (January 1998)*. doi:
- Callao, S., Jarne, J. I. and Wróblewski, D. (2014) 'Debates and studies on earnings management: a geographical perspective', *Zeszyty Teoretyczne Rachunkowości*, 2014(75(131)), pp. 145-169. doi: 10.5604/16414381.1098803
- Cameron, A. B. and Stephens, L. (1991) 'The Treatment of Non-Recurring Items in the Income Statement and their Consistency with FASB Concept Statements', *Abacus*, 27(2), pp. 81-96. doi: 10.1111/j.1467-6281.1991.tb00260.x

- Capalbo, F., Sorrentino, M. and Smarra, M. (2018) 'Earnings Management and State Ownership: A Primary Literature Review', *International Journal of Business and Management*, 13(6), pp. 117. doi: 10.5539/ijbm.v13n6p117
- Capkun, V., Collins, D. and Jeanjean, T. (2016) 'The effect of IAS/IFRS adoption on earnings management (smoothing): A closer look at competing explanations', *Journal of Accounting and Public Policy*, 35(4), pp. 352-394. doi: 10.1016/j.jaccpubpol.2016.04.002
- Caylor, M. L. (2010) 'Strategic revenue recognition to achieve earnings benchmarks', *Journal of Accounting and Public Policy*, 29(1), pp. 82-95. doi: 10.1016/j.jaccpubpol.2009.10.008
- Ceric, A. (2014) 'STRATEGIES FOR MINIMIZING INFORMATION ASYMMETRIES IN CONSTRUCTION PROJECTS: PROJECT MANAGERS' PERCEPTIONS', *Journal of Business Economics and Management*, 15(3), pp. 424-440. doi: 10.3846/16111699.2012.720601
- Chadee, D. and Roxas, B. (2013) 'Institutional environment, innovation capacity and firm performance in Russia', *Critical perspectives on international business*, 9(1/2), pp. 19-39. doi: 10.1108/17422041311299923
- Chaney, P. K., Devinney, T. M. and Winer, R. S. (1991) 'The Impact of New Product Introductions on the Market Value of Firms', *The Journal of Business*, 64(4), pp. 573. doi: 10.1086/296552
- Chaney, P. K. and Lewis, C. M. (1995) 'Earnings management and firm valuation under asymmetric information', *Journal of Corporate Finance*, 1(3-4), pp. 319-345. doi: 10.1016/0929-1199(94)00008-i
- Chen, C.-L., Huang, S.-H. and Fan, H.-S. (2012) 'Complementary association between real activities and accruals-based manipulation in earnings reporting', *Journal of Economic Policy Reform*, 15(2), pp. 93-108. doi: 10.1080/17487870.2012.667965
- Chen, E., Gaviious, I. and Lev, B. (2017) 'The positive externalities of IFRS R&D capitalization: enhanced voluntary disclosure', *Review of Accounting Studies*, 22(2), pp. 677-714. doi: 10.1007/s11142-017-9399-x
- Cheng, Q. and Warfield, T. D. (2005) 'Equity Incentives and Earnings Management', *The Accounting Review*, 80(2), pp. 441-476. doi: 10.2308/accr.2005.80.2.441
- Cheng, S. (2004) 'R&D Expenditures and CEO Compensation', *The Accounting Review*, 79(2), pp. 305-328. doi: 10.2308/accr.2004.79.2.305
- Cherensky, S. S. (1994) 'Shareholders, managers, and corporate R&D spending: An agency cost model', *Santa Clara Computer & High Tech. LJ*, 10, pp. 299. doi:
- Chi, W., Lisic, L. L. and Pevzner, M. (2011) 'Is enhanced audit quality associated with greater real earnings management?', *Accounting horizons*, 25(2), pp. 315-335. doi:
- Chih, H.-L., Shen, C.-H. and Kang, F.-C. (2008) 'Corporate social responsibility, investor protection, and earnings management: Some international evidence', *Journal of business ethics*, 79(1-2), pp. 179-198. doi:
- Cho, S. Y. and Sachs, K. D. (2012) 'Earnings management and deregulation: The case of motor carriers', *Journal of Accounting and Public Policy*, 31(5), pp. 451-470. doi: 10.1016/j.jaccpubpol.2012.08.002
- Chowdhury, D. (2012) *Incentives, control and development: Governance in private and public sector with special reference to Bangladesh*. Dhaka viswavidyalay prakashana samstha University of Dhaka.
- Claessens, S., Djankov, S. and Lang, L. H. P. (2000) 'The separation of ownership and control in East Asian Corporations', *Journal of Financial Economics*, 58(1-2), pp. 81-112. doi: 10.1016/s0304-405x(00)00067-2

- Cohen, D. A., Dey, A. and Lys, T. Z. (2008) 'Real and Accrual-Based Earnings Management in the Pre- and Post-Sarbanes-Oxley Periods', *The Accounting Review*, 83(3), pp. 757-787. doi: 10.2308/accr.2008.83.3.757
- Cohen, D. A. and Zarowin, P. (2010) 'Accrual-based and real earnings management activities around seasoned equity offerings', *Journal of Accounting and Economics*, 50(1), pp. 2-19. doi: 10.1016/j.jacceco.2010.01.002
- Collins, D. W., Pincus, M. and Xie, H. (1999) 'Equity valuation and negative earnings: The role of book value of equity', *The Accounting Review*, 74(1), pp. 29-61. doi:
- Collins, D. W., Rozeff, M. S. and Dhaliwal, D. S. (1981) 'The economic determinants of the market reaction to proposed mandatory accounting changes in the oil and gas industry', *Journal of Accounting and Economics*, 3(1), pp. 37-71. doi: 10.1016/0165-4101(81)90034-3
- Collis, J. and Hussey, R. (2013) *Business research: A practical guide for undergraduate and postgraduate students*. Macmillan International Higher Education.
- Council, C. M. I. (2008) 'Innovation, Research and Development Needs in Mineral Processing and Extractive Metallurgy', *Report prepared by the CMIC secretariat*. doi:
- Curuk, T. and Yasar, A. (2014) 'THE ASSOCIATION BETWEEN EARNINGS MANAGEMENT AND AUDITOR REPORTING: EVIDENCE FROM TURKISH STOCK MARKET', *International Journal of Academic Research*, 6(3). doi:
- Czarnitzki, D. and Toole, A. A. (2008) 'The R&D Investment-Uncertainty Relationship: Do Competition and Firm Size Matter?', *SSRN Electronic Journal*. doi: 10.2139/ssrn.1103467
- Damanpour, F. (1991) 'Organizational Innovation: A Meta-Analysis Of Effects Of Determinants and Moderators', *Academy of Management Journal*, 34(3), pp. 555-590. doi: 10.5465/256406
- Damodar N, G. 2004. Basic econometrics. The Mc-Graw Hill.
- Damodaran, A. (1999) 'FINANCING INNOVATIONS AND CAPITAL STRUCTURE CHOICES', *Journal of Applied Corporate Finance*, 12(1), pp. 28-39. doi: 10.1111/j.1745-6622.1999.tb00657.x
- Davidson, R., Goodwin-Stewart, J. and Kent, P. (2005) 'Internal governance structures and earnings management', *Accounting & Finance*, 45(2), pp. 241-267. doi:
- Davis, L. N. (2001) 'R&D Investments, Information and Strategy', *Technology Analysis & Strategic Management*, 13(3), pp. 325-342. doi: 10.1080/09537320120088165
- Deangelo, L. (1986) 'Accounting Numbers as Market Valuation Substitutes: A Study of Management Buyouts of Public Stockholders', *The Accounting Review*, 61(3), pp. 400. doi:
- Dechow, P., Sloan, R. G. and Sweeney, A. P. (1995) 'DETECTING EARNINGS MANAGEMENT', *Account. Rev.*, 70(2), pp. 193-225. doi:
- Dechow, P. M., Ge, W., Larson, C. R. and Sloan, R. G. (2011) 'Predicting Material Accounting Misstatements*', *Contemporary Accounting Research*, 28(1), pp. 17-82. doi: 10.1111/j.1911-3846.2010.01041.x
- Dechow, P. M., Kothari, S. P. and L. Watts, R. (1998) 'The relation between earnings and cash flows', *Journal of Accounting and Economics*, 25(2), pp. 133-168. doi: 10.1016/s0165-4101(98)00020-2
- Dechow, P. M., Myers, L. A. and Shakespeare, C. (2010) 'Fair value accounting and gains from asset securitizations: A convenient earnings management tool with compensation side-benefits', *Journal of accounting and economics*, 49(1-2), pp. 2-25. doi:
- Dechow, P. M., Richardson, S. A. and Tuna, I. (2003) *Review of Accounting Studies*, 8(2/3), pp. 355-384. doi: 10.1023/a:1024481916719

- Dechow, P. M. and Skinner, D. J. (2000) 'Earnings Management: Reconciling the Views of Accounting Academics, Practitioners, and Regulators', *Accounting Horizons*, 14(2), pp. 235-250. doi: 10.2308/acch.2000.14.2.235
- Dechow, P. M. and Sloan, R. G. (1991) 'Executive incentives and the horizon problem', *Journal of Accounting and Economics*, 14(1), pp. 51-89. doi: 10.1016/0167-7187(91)90058-s
- Degeorge, F., Patel, J. and Zeckhauser, R. (1999) 'Earnings Management to Exceed Thresholds', *The Journal of Business*, 72(1), pp. 1-33. doi: 10.1086/209601
- Demski, J. S. (2008) 'Where is the Passion?', *Accounting Horizons*, 22(4), pp. 437-437. doi: 10.2308/acch.2008.22.4.437
- Desender, K. A., Castro, C. E. and De LeÓN, S. A. E. (2011) 'Earnings Management and Cultural Values', *American Journal of Economics and Sociology*, 70(3), pp. 639-670. doi: 10.1111/j.1536-7150.2011.00786.x
- Doloreux, D. (2004) 'Regional Innovation Systems in Canada: A Comparative Study', *Regional Studies*, 38(5), pp. 479-492. doi: 10.1080/0143116042000229267
- Donnelly, R. A. (2012) *Business statistics*. Pearson.
- Drucker, P. F. (2002) 'The discipline of innovation', *Harvard business review*, 80, pp. 95-104. doi:
- Dushnitsky, G. and Lenox, M. J. (2005) 'When do firms undertake R&D by investing in new ventures?', *Strategic Management Journal*, 26(10), pp. 947-965. doi: 10.1002/smj.488
- Dzisah, J. and Etzkowitz, H. (2008) 'Triple helix circulation: the heart of innovation and development', *International Journal of Technology Management and Sustainable Development*, 7(2), pp. 101-115. doi: 10.1386/ijtm.7.2.101_1
- Easter-Smith, M., Thorpe, R. and Lowe, A. (2002) 'The Philosophy of Research Design', Bennett N., Glatte R., Levacic R. *Improving Educational Management: Through Research and Consultancy*. London, Paul Chapman Publishing Limited. doi:
- Eberhart, A. C., Maxwell, W. F. and Siddique, A. R. (2004) 'An Examination of Long-Term Abnormal Stock Returns and Operating Performance Following R&D Increases', *The Journal of Finance*, 59(2), pp. 623-650. doi: 10.1111/j.1540-6261.2004.00644.x
- Ebrahim, A. (2007) 'Earnings management and board activity: an additional evidence', *Review of Accounting and Finance*, 6(1), pp. 42-58. doi: 10.1108/14757700710725458
- Efendi, J., Srivastava, A. and Swanson, E. P. (2007) 'Why do corporate managers misstate financial statements? The role of option compensation and other factors', *Journal of Financial Economics*, 85(3), pp. 667-708. doi: 10.1016/j.jfineco.2006.05.009
- Ehie, I. C. and Olibe, K. (2010) 'The effect of R&D investment on firm value: An examination of US manufacturing and service industries', *International Journal of Production Economics*, 128(1), pp. 127-135. doi: 10.1016/j.ijpe.2010.06.005
- El Diri, M. a. (2018) *Introduction to Earnings Management*. Cham : Springer International Publishing : Imprint: Springer.
- Enomoto, M., Kimura, F. and Yamaguchi, T. (2015) 'Accrual-based and real earnings management: An international comparison for investor protection', *Journal of Contemporary Accounting & Economics*, 11(3), pp. 183-198. doi: 10.1016/j.jcae.2015.07.001
- Erickson, M. and Wang, S.-w. (1999) 'Earnings management by acquiring firms in stock for stock mergers', *Journal of Accounting and Economics*, 27(2), pp. 149-176. doi: 10.1016/s0165-4101(99)00008-7
- Ettlie, J. E. (1998) 'R&D and Global Manufacturing Performance', *Management Science*, 44(1), pp. 1-11. doi: 10.1287/mnsc.44.1.1
- Evan, W. (1966) 'Organizational Lag', *Human Organization*, 25(1), pp. 51-53. doi: 10.17730/humo.25.1.v7354t3822136580

- Evans, M. E., Houston, R. W., Peters, M. F. and Pratt, J. H. (2014) 'Reporting Regulatory Environments and Earnings Management: U.S. and Non-U.S. Firms Using U.S. GAAP or IFRS', *The Accounting Review*, 90(5), pp. 1969-1994. doi: 10.2308/accr-51008
- Faried, M., Saad, M. and Almarri, K. 'Key Success Factors Impacting the Success of Innovation in UAE Construction Projects'. *International Sustainable Buildings Symposium*: Springer, 482-505.
- Farrell, K., Unlu, E. and Yu, J. (2014) 'Stock repurchases as an earnings management mechanism: The impact of financing constraints', *Journal of Corporate Finance*, 25, pp. 1-15. doi: 10.1016/j.jcorpfin.2013.10.004
- Ferramosca, S. and Allegrini, M. (2018) 'The complex role of family involvement in earnings management', *Journal of Family Business Strategy*, 9(2), pp. 128-141. doi:
- Fields, T. D., Lys, T. Z. and Vincent, L. (2001) 'Empirical research on accounting choice', *Journal of Accounting and Economics*, 31(1-3), pp. 255-307. doi: 10.1016/s0165-4101(01)00028-3
- Filippov, S. (2011) 'Innovation and R&D in emerging Russian multinationals', *Economics, Management, and Financial Markets*, 6(1), pp. 182-206. doi:
- Fleming, L., King, C. and Juda, A. I. (2007) 'Small Worlds and Regional Innovation', *Organization Science*, 18(6), pp. 938-954. doi: 10.1287/orsc.1070.0289
- Francis, J. R. and Wang, D. (2008) 'The Joint Effect of Investor Protection and Big 4 Audits on Earnings Quality around the World', *Contemporary Accounting Research*, 25(1), pp. 157-91. doi: 10.1506/car.25.1.6
- Frank, M. M., Lynch, L. J. and Rego, S. O. (2009) 'Tax Reporting Aggressiveness and Its Relation to Aggressive Financial Reporting', *The Accounting Review*, 84(2), pp. 467-496. doi: 10.2308/accr.2009.84.2.467
- Frankel, R. M., Johnson, M. F. and Nelson, K. K. (2002) 'The Relation between Auditors' Fees for Nonaudit Services and Earnings Management', *The Accounting Review*, 77(s-1), pp. 71-105. doi: 10.2308/accr.2002.77.s-1.71
- Gailly, B. 2018. Introduction: Make Sense of Innovation. *Navigating Innovation*. Springer International Publishing.
- Garanina, T. and Nikolaeva, Y. (2016) 'Earnings Management in Companies Seeking to be Acquired and its Effect on Chances of Subsequent Acquisition', *SSRN Electronic Journal*. doi: 10.2139/ssrn.3490565
- Gaver, J. J. and Paterson, J. S. (2007) 'The influence of large clients on office-level auditor oversight: Evidence from the property-casualty insurance industry', *Journal of Accounting and Economics*, 43(2-3), pp. 299-320. doi: 10.1016/j.jacceco.2007.02.003
- Geiger, M. A. and North, D. S. (2006) 'Does hiring a new CFO change things? An investigation of changes in discretionary accruals', *The Accounting Review*, 81(4), pp. 781-809. doi:
- Ghasemi, A. and Zahediasl, S. (2012) 'Normality tests for statistical analysis: a guide for non-statisticians', *International journal of endocrinology and metabolism*, 10(2), pp. 486-489. doi: 10.5812/ijem.3505
- Gill-de-Albornoz, B. and Illueca, M. (2005) 'Earnings management under price regulation: Empirical evidence from the Spanish electricity industry', *Energy Economics*, 27(2), pp. 279-304. doi: 10.1016/j.eneco.2004.12.005
- Gilson, R. J. and Gordon, J. N. (2003) 'Controlling Controlling Shareholders', *University of Pennsylvania Law Review*, 152(2), pp. 785. doi: 10.2307/3313035
- Giroux, G. (2004) *Detecting earnings management*. John Wiley & Sons Incorporated.
- Goel, S. (2012) 'Demystifying earnings management through accruals management: An Indian Corporate Study', *Vikalpa*, 37(1), pp. 49-56. doi:

- Gong, J. J. and Wang, S. I. L. (2016) 'Changes in the value relevance of research and development expenses after IFRS adoption', *Advances in Accounting*, 35, pp. 49-61. doi: 10.1016/j.adiac.2016.05.002
- Gosalia, K. (2010) *Earnings Quality Differential Between Canadian and US Public Companies*.
- Grabińska, B. and Grabiński, K. (2018) 'The Impact of R&D expenditures on earnings management', *Argumenta Oeconomica Cracoviensia*, (17), pp. 53-72. doi:
- Graham, J. R., Harvey, C. R. and Rajgopal, S. (2005) 'The economic implications of corporate financial reporting', *Journal of Accounting and Economics*, 40(1-3), pp. 3-73. doi: 10.1016/j.jacceco.2005.01.002
- Griliches, Z. (1987) 'R&D and productivity: Measurement issues and econometric results', *Science*, 237(4810), pp. 31-35. doi:
- Grix, J. 2010. *The Foundations of Research*. Macmillan Education UK.
- Gu, Z., Lee, C.-W. J. and Rosett, J. G. (2005) 'What Determines the Variability of Accounting Accruals?', *Review of Quantitative Finance and Accounting*, 24(3), pp. 313-334. doi: 10.1007/s11156-005-6869-1
- Guan, L., Wright, C. J. and Leikam, S. L. (2005) 'Earnings Management and Forced CEO Dismissal', *Advances in Accounting*, 21, pp. 61-81. doi: 10.1016/s0882-6110(05)21003-9
- Guay, W. R., Kothari, S. P. and Watts, R. L. (1996) 'A Market-Based Evaluation of Discretionary Accrual Models', *Journal of Accounting Research*, 34, pp. 83. doi: 10.2307/2491427
- Guba, E. G. 'The paradigm dialog'. *Alternative Paradigms Conference, Mar, 1989, Indiana U, School of Education, San Francisco, CA, US*: Sage Publications, Inc.
- Guidara, R. and Boujelbene, Y. (2014) 'Earnings management around research and development manipulation', *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 4(2), pp. 30-41. doi:
- Guido, F. M., Chávez, A. F. and Lincoln, Y. S. (2010) 'Underlying Paradigms in Student Affairs Research and Practice', *Journal of Student Affairs Research and Practice*, 47(1), pp. 1-22. doi: 10.2202/1949-6605.6017
- Guillén, M. F. and García-Canal, E. (2009) 'The American Model of the Multinational Firm and the "New" Multinationals From Emerging Economies', *Academy of Management Perspectives*, 23(2), pp. 23-35. doi: 10.5465/amp.2009.39985538
- Gunday, G., Ulusoy, G., Kilic, K. and Alpkan, L. (2011) 'Effects of innovation types on firm performance', *International Journal of Production Economics*, 133(2), pp. 662-676. doi: 10.1016/j.ijpe.2011.05.014
- Gunny, K. A. (2010) 'The Relation Between Earnings Management Using Real Activities Manipulation and Future Performance: Evidence from Meeting Earnings Benchmarks*', *Contemporary Accounting Research*, 27(3), pp. 855-888. doi: 10.1111/j.1911-3846.2010.01029.x
- Gunzenhauser, M. G. and Gerstl-Pepin, C. I. (2006) 'Engaging graduate education: A pedagogy for epistemological and theoretical diversity', *The Review of Higher Education*, 29(3), pp. 319-346. doi:
- Habbash, M. and Alghamdi, S. (2017) 'Audit quality and earnings management in less developed economies: the case of Saudi Arabia', *Journal of Management & Governance*, 21(2), pp. 351-373. doi:
- Hall, B. (1989) *The Impact of Corporate Restructuring on Industrial Research and Development*: National Bureau of Economic Research. Available at: <http://dx.doi.org/10.3386/w3216>.

- Hall, B. H. (2002) 'The Financing of Research and Development', *Oxford Review of Economic Policy*, 18(1), pp. 35-51. doi: 10.1093/oxrep/18.1.35
- Hall, B. H., Griliches, Z. and Hausman, J. A. (1984) *Patents and R&D: Is there a lag?* : National Bureau of Economic Research (0898-2937).
- Hall, B. H. and Lerner, J. (2010) 'The financing of R&D and innovation', *Handbook of the Economics of Innovation*: Elsevier, pp. 609-639.
- Hameed, I., Khan, M., Shahab, A., Hameed, I. and Qadeer, F. (2016) 'Science, Technology and Innovation through Entrepreneurship Education in the United Arab Emirates (UAE)', *Sustainability*, 8(12), pp. 1280. doi: 10.3390/su8121280
- Hammersley, M. (2009) 'Challenging relativism: The problem of assessment criteria', *Qualitative Inquiry*, 15(1), pp. 3-29. doi:
- Han, J. C. and Wang, S.-w. (1998) 'Political costs and earnings management of oil companies during the 1990 Persian Gulf crisis', *Accounting review*, pp. 103-117. doi:
- Han, S., Kang, T., Salter, S. and Yoo, Y. K. (2010) 'A cross-country study on the effects of national culture on earnings management', *Journal of International Business Studies*, 41(1), pp. 123-141. doi:
- Haniffa, R., Rahman, R. A. and Ali, F. H. M. (2006) 'Board, audit committee, culture and earnings management: Malaysian evidence', *Managerial auditing journal*. doi:
- Hansen, J., Stephens, N. M. and Wood, D. A. (2009) 'Entity-level controls: The internal auditor's assessment of management tone at the top', *Current Issues in Auditing*, 3(1), pp. A1-A13. doi:
- Hanson, P. W. (2018) 'Automobility and site ontological analysis', *Mobilities*, 13(5), pp. 647-661. doi:
- Harrison, R. L. (2013) 'Using mixed methods designs in the Journal of Business Research, 1990–2010', *Journal of Business Research*, 66(11), pp. 2153-2162. doi: 10.1016/j.jbusres.2012.01.006
- Hastori, H., Siregar, H., Sembel, R. and Maulana, T. N. A. (2015) 'Agency Costs, Corporate Governance and Ownership Concentration: The Case of Agro-industrial Companies in Indonesia', *Asian Social Science*, 11(18). doi: 10.5539/ass.v11n18p311
- Hayes, A. F. and Cai, L. (2007) 'Using heteroskedasticity-consistent standard error estimators in OLS regression: An introduction and software implementation', *Behavior Research Methods*, 39(4), pp. 709-722. doi: 10.3758/bf03192961
- Hayn, C. (1995) 'The information content of losses', *Journal of Accounting and Economics*, 20(2), pp. 125-153. doi: 10.1016/0165-4101(95)00397-2
- Healy, P. M. (1985) 'The effect of bonus schemes on accounting decisions', *Journal of Accounting and Economics*, 7(1-3), pp. 85-107. doi: 10.1016/0165-4101(85)90029-1
- Healy, P. M. and Wahlen, J. M. (1999) 'A Review of the Earnings Management Literature and Its Implications for Standard Setting', *Accounting Horizons*, 13(4), pp. 365-383. doi: 10.2308/acch.1999.13.4.365
- Hill, C. W. and Jones, T. M. (1992) 'Stakeholder-agency theory', *Journal of management studies*, 29(2), pp. 131-154. doi:
- Himmelberg, C. P. and Petersen, B. C. (1994) 'R & D and Internal Finance: A Panel Study of Small Firms in High-Tech Industries', *The Review of Economics and Statistics*, 76(1), pp. 38. doi: 10.2307/2109824
- Hines Jr, J. and Desai, M. A. (2005) 'Value-added taxes and international trades: the evidence', *Unpublished Manuscript*. doi:
- Hirao, T. and Hoshino, Y. 'How Does a Platform Leader Keep its Platform Profitable?'. *ECIE2015-10th European Conference on Innovation and Entrepreneurship: ECIE 2015*: Academic Conferences and publishing limited, 252.

- Hitt, M. A., Ireland, R. D., Harrison, J. S. and Hoskisson, R. E. (1991) 'EFFECTS OF ACQUISITIONS ON R&D INPUTS AND OUTPUTS', *Academy of Management Journal*, 34(3), pp. 693-706. doi: 10.2307/256412
- Holland, D. and Ramsay, A. (2003) 'Do Australian companies manage earnings to meet simple earnings benchmarks?', *Accounting & Finance*, 43(1), pp. 41-62. doi: 10.1111/1467-629x.00082
- Holmstrom, B. (1989) 'Agency costs and innovation', *Journal of Economic Behavior & Organization*, 12(3), pp. 305-327. doi: 10.1016/0167-2681(89)90025-5
- Holthausen, R. W. (1981) 'Evidence on the effect of bond covenants and management compensation contracts on the choice of accounting techniques', *Journal of Accounting and Economics*, 3(1), pp. 73-109. doi: 10.1016/0165-4101(81)90035-5
- Holthausen, R. W., Larcker, D. F. and Sloan, R. G. (1995) 'Annual bonus schemes and the manipulation of earnings', *Journal of Accounting and Economics*, 19(1), pp. 29-74. doi: 10.1016/0165-4101(94)00376-g
- Hribar, P. and Collins, D. W. (2002) 'Errors in Estimating Accruals: Implications for Empirical Research', *Journal of Accounting Research*, 40(1), pp. 105-134. doi: 10.1111/1475-679x.00041
- Hribar, P., Jenkins, N. T. and Johnson, W. B. (2006) 'Stock repurchases as an earnings management device', *Journal of Accounting and Economics*, 41(1-2), pp. 3-27. doi: 10.1016/j.jacceco.2005.10.002
- Hsu, Y. (2017) 'Design-oriented strategy typology and innovation framework', *Journal of Engineering, Design and Technology*, 15(1), pp. 13-30. doi: 10.1108/JEDT-09-2015-0053
- Hull, C. E. and Lio, B. H. (2006) 'Innovation in non-profit and for-profit organizations: Visionary, strategic, and financial considerations', *Journal of Change Management*, 6(1), pp. 53-65. doi: 10.1080/14697010500523418
- Hunt, A., Moyer, S. and Shevlin, T. (2000) 'Earnings volatility, earnings management, and equity value', *Unpublished working paper. University of Washington*. doi:
- Hussey, J. H. 'R.(1997)', *Business Research: A Practical Guide for Undergraduate and Postgraduate Students*. doi:
- IASB, E. D. 2008. An improved conceptual framework for financial reporting. IASB.
- Ittner, C. D. and Larcker, D. F. (2001) 'Assessing empirical research in managerial accounting: a value-based management perspective', *Journal of Accounting and Economics*, 32(1-3), pp. 349-410. doi: 10.1016/s0165-4101(01)00026-x
- Jackson, A. B. (2017) 'Discretionary Accruals: Earnings Management ... or Not?', *Abacus*, 54(2), pp. 136-153. doi: 10.1111/abac.12117
- Jackson, S. B. and Wilcox, W. E. (2000) 'Do managers grant sales price reductions to avoid losses and declines in earnings and sales?', *Quarterly Journal of Business and Economics*, pp. 3-20. doi:
- Jaggi, B. and Leung, S. (2007) 'Impact of family dominance on monitoring of earnings management by audit committees: Evidence from Hong Kong', *Journal of International Accounting, Auditing and Taxation*, 16(1), pp. 27-50. doi: 10.1016/j.intaccudtax.2007.01.003
- Jensen, M. C. and Meckling, W. H. (1976) 'Theory of the firm: Managerial behavior, agency costs and ownership structure', *Journal of Financial Economics*, 3(4), pp. 305-360. doi: 10.1016/0304-405x(76)90026-x
- Jeppson, N. and Nathan, H. (2012) 'INNOVATION FOCUSED STRATEGY AND EARNINGS MANAGEMENT', *Doctoral dissertation*. doi. Available at: http://rave.ohiolink.edu/etdc/view?acc_num=kent1363978241

- Jiang, F., Jiang, Z., Kim, K. A. and Zhang, M. (2015) 'Family-firm risk-taking: Does religion matter?', *Journal of Corporate Finance*, 33, pp. 260-278. doi: 10.1016/j.jcorpfin.2015.01.007
- Jill, H. and Roger, H. 1997. Business research: a practical guide for undergraduate and postgraduate students. Macmillan.
- Jiraporn, P., Miller, G. A., Yoon, S. S. and Kim, Y. S. (2008) 'Is earnings management opportunistic or beneficial? An agency theory perspective', *International Review of Financial Analysis*, 17(3), pp. 622-634. doi: 10.1016/j.irfa.2006.10.005
- John, A. O. and Adebayo, O. (2013) 'Effect of firm size on profitability: Evidence from Nigerian manufacturing sector', *Prime Journal of Business Administration and Management (BAM)*, 3(9), pp. 1171-1175. doi:
- Jones, J. J. (1991) 'Earnings Management During Import Relief Investigations', *Journal of Accounting Research*, 29(2), pp. 193. doi: 10.2307/2491047
- Jordan, C. E. and Clark, S. J. (2004) 'Big bath earnings management: the case of goodwill impairment under SFAS No. 142', *Journal of Applied Business Research (JABR)*, 20(2). doi:
- Joseph, J., Ocasio, W. and McDonnell, M.-H. (2014) 'The structural elaboration of board independence: Executive power, institutional logics, and the adoption of CEO-only board structures in US corporate governance', *Academy of Management Journal*, 57(6), pp. 1834-1858. doi:
- Joseph, K. and Wintoki, M. B. (2013) 'Advertising investments, information asymmetry, and insider gains', *Journal of Empirical Finance*, 22, pp. 1-15. doi: 10.1016/j.jempfin.2013.02.004
- Kaliappen, N. and Hilman, H. (2014) 'Does Service Innovation Act as a Mediator in Differentiation Strategy and Organizational Performance Nexus? An Empirical Study', *Asian Social Science*, 10(11). doi: 10.5539/ass.v10n11p123
- Kalnins, A. (2018) 'Multicollinearity: How common factors cause Type 1 errors in multivariate regression', *Strategic Management Journal*, 39(8), pp. 2362-2385. doi: 10.1002/smj.2783
- Kamm, J. B. (1986) 'THE PORTFOLIO APPROACH TO DIVISIONAL INNOVATION STRATEGY', *Journal of Business Strategy*, 7(1), pp. 25-36. doi: 10.1108/eb039139
- Keating, A. S. and L. Zimmerman, J. (1999) 'Depreciation-policy changes: tax, earnings management, and investment opportunity incentives', *Journal of Accounting and Economics*, 28(3), pp. 359-389. doi: 10.1016/s0165-4101(00)00004-5
- Kerr, W. R. and Nanda, R. (2015) 'Financing innovation', *Annual Review of Financial Economics*, 7, pp. 445-462. doi:
- Kerstein, J. and Rai, A. (2007) 'Intra-year shifts in the earnings distribution and their implications for earnings management', *Journal of Accounting and Economics*, 44(3), pp. 399-419. doi: 10.1016/j.jacceco.2007.04.004
- Kighir, A., Omar, N. and Mohamed, N. (2014) 'Earnings Management Detection Modeling: A Methodological', *World*, 4(1). doi:
- Kirschenheiter, M. and Melumad, N. D. (2002) 'Can "big bath" and earnings smoothing co-exist as equilibrium financial reporting strategies?', *Journal of Accounting Research*, 40(3), pp. 761-796. doi:
- Klein, A. (2002) 'Audit committee, board of director characteristics, and earnings management', *Journal of Accounting and Economics*, 33(3), pp. 375-400. doi: 10.1016/s0165-4101(02)00059-9
- Klochikhin, E. A. (2013) 'Innovation system in transition: Opportunities for policy learning between China and Russia', *Science and Public Policy*, 40(5), pp. 657-673. doi: 10.1093/scipol/sct021

- Kogabayev, T. and Maziliauskas, A. (2017) 'The definition and classification of innovation', *HOLISTICA – Journal of Business and Public Administration*, 8(1), pp. 59-72. doi: 10.1515/hjbpa-2017-0005
- Koh, K., Matsumoto, D. A. and Rajgopal, S. (2008) 'Meeting or beating analyst expectations in the post-scandals world: Changes in stock market rewards and managerial actions', *Contemporary Accounting Research*, 25(4), pp. 1067-1098. doi:
- Kor, Y. Y. (2006) 'Direct and interaction effects of top management team and board compositions on R&D investment strategy', *Strategic Management Journal*, 27(11), pp. 1081-1099. doi: 10.1002/smj.554
- Kothari, S. P., Leone, A. J. and Wasley, C. E. (2005) 'Performance matched discretionary accrual measures', *Journal of Accounting and Economics*, 39(1), pp. 163-197. doi: 10.1016/j.jacceco.2004.11.002
- Kothari, S. P., Mizik, N. and Roychowdhury, S. (2016) 'Managing for the moment: The role of earnings management via real activities versus accruals in SEO valuation', *The Accounting Review*, 91(2), pp. 559-586. doi:
- Kouaib, A. and Jarboui, A. (2014) 'External audit quality and ownership structure: interaction and impact on earnings management of industrial and commercial Tunisian sectors', *Journal of Economics Finance and Administrative Science*, 19(37), pp. 78-89. doi:
- Kouaib, A. and Jarboui, A. (2016) 'Real earnings management in innovative firms: Does CEO profile make a difference?', *Journal of Behavioral and Experimental Finance*, 12, pp. 40-54. doi: 10.1016/j.jbef.2016.09.002
- Lee, B. B. and Choi, B. (2002) 'Company size, auditor type, and earnings management', *Journal of Forensic Accounting*, 3(1), pp. 27-50. doi:
- Lee, C.-H. and Chou, P.-I. (2020) 'Industry competition, earnings management and leader–follower effects', *Applied Economics*, 52(4), pp. 388-399. doi:
- Lee, C.-W. J., Li, L. Y. and Yue, H. (2006) 'Performance, Growth and Earnings Management', *Review of Accounting Studies*, 11(2-3), pp. 305-334. doi: 10.1007/s11142-006-9009-9
- Lee, N. and Swenson, C. (2011a) 'Earnings Management through Discretionary Expenditures in The U.S., Canada, and Asia', *International Business Research*, 4(2). doi: 10.5539/ibr.v4n2p257
- Lee, N. and Swenson, C. (2011b) 'Earnings management through discretionary expenditures in the US, Canada, and Asia', *International Business Research*, 4(2), pp. 257. doi:
- Leone, A. J. and Rock, S. (2002) 'Empirical tests of budget ratcheting and its effect on managers' discretionary accrual choices', *Journal of Accounting and Economics*, 33(1), pp. 43-67. doi: 10.1016/s0165-4101(01)00044-1
- Leuz, C., Nanda, D. and Wysocki, P. D. (2003) 'Earnings management and investor protection: an international comparison', *Journal of Financial Economics*, 69(3), pp. 505-527. doi: 10.1016/s0304-405x(03)00121-1
- Lev, B. and Sougiannis, T. (1996) 'The capitalization, amortization, and value-relevance of R&D', *Journal of Accounting and Economics*, 21(1), pp. 107-138. doi: 10.1016/0165-4101(95)00410-6
- Li, X. D. (2016) 'The Impact of the Sarbanes-Oxley Act on Earnings Management Using Classification Shifting: Evidence from Core Earnings and Special Items', *Accounting & Taxation*, 8(1), pp. 39-48. doi:
- Lisowsky, P. (2010) 'Seeking shelter: Empirically modeling tax shelters using financial statement information', *The Accounting Review*, 85(5), pp. 1693-1720. doi:
- Liu, A. Z. (2014) 'Can external monitoring affect corporate financial reporting and disclosure? Evidence from earnings and expectations management', *Accounting Horizons*, 28(3), pp. 529-559. doi:

- Liu, G. and Sun, J. (2015) 'Did the Mandatory Adoption of IFRS Affect the Earnings Quality of Canadian Firms?', *Accounting Perspectives*, 14(3), pp. 250-275. doi: 10.1111/1911-3838.12047
- Liu, Z.-J. (2016) 'Effect of earnings management on economic value added: A cross-country study', *South African Journal of Business Management*, 47(1), pp. 29-36. doi:
- Lumpkin, G. T. and Dess, G. G. (1996) 'Clarifying the Entrepreneurial Orientation Construct and Linking It to Performance', *The Academy of Management Review*, 21(1), pp. 135. doi: 10.2307/258632
- Lyytinen, K., Yoo, Y. and Boland Jr, R. J. (2016) 'Digital product innovation within four classes of innovation networks', *Information Systems Journal*, 26(1), pp. 47-75. doi:
- Maali, B. M. and Jaara, O. O. (2014) 'Reality and Accounting: The Case for Interpretive Accounting Research', *International Journal of Accounting and Financial Reporting*, 4(1), pp. 155. doi: 10.5296/ijaf.v4i1.5468
- Madichie, N. O. (2011) 'IRENA – Masdar City (UAE) – exemplars of innovation into emerging markets', *Foresight*, 13(6), pp. 34-47. doi: 10.1108/14636681111179582
- Malofeeva, T. N. (2018) 'The Impact of IFRS Adoption on Earnings Management in Russia', *EUROPEAN RESEARCH STUDIES JOURNAL*, XXI(Issue 2), pp. 147-164. doi: 10.35808/ersj/991
- Mansfield, E. R. and Helms, B. P. (1982) 'Detecting multicollinearity', *The American Statistician*, 36(3a), pp. 158-160. doi:
- Markarian, G., Pozza, L. and Prencipe, A. (2008) 'Capitalization of R&D costs and earnings management: Evidence from Italian listed companies', *The International Journal of Accounting*, 43(3), pp. 246-267. doi:
- Marquardt, C. and Wiedman, C. (2005) 'Earnings Management through Transaction Structuring: Contingent Convertible Debt and Diluted Earnings per Share', *Journal of Accounting Research*, 43(2), pp. 205-243. doi: 10.1111/j.1475-679x.2005.00168.x
- Matis, D., Vladu, A. B., Negrea, L. and Sucala, L. (2010) 'JONES, DECHOW AND KASZNIK MODELS SIGNIFICANCE IN THE ROMANIAN ECONOMIC ENVIRONMENT', *Annales Universitatis Apulensis-Series Oeconomica*, 12(1). doi:
- Matsumoto, D. A. (2002) 'Management's Incentives to Avoid Negative Earnings Surprises', *The Accounting Review*, 77(3), pp. 483-514. doi: 10.2308/accr.2002.77.3.483
- Maynard, M. (1994) 'Methods, practice and epistemology: The debate about feminism and research', *Researching women's lives from a feminist perspective*, 10(26), pp. 10-26. doi:
- McClelland, P. L., Barker, V. L. and Oh, W.-Y. (2012) 'CEO career horizon and tenure: Future performance implications under different contingencies', *Journal of Business Research*, 65(9), pp. 1387-1393. doi: 10.1016/j.jbusres.2011.09.003
- McNichols, M. and Wilson, G. P. (1988) 'Evidence of Earnings Management from the Provision for Bad Debts', *Journal of Accounting Research*, 26, pp. 1. doi: 10.2307/2491176
- McNichols, M. F. (2000) 'Research design issues in earnings management studies', *Journal of Accounting and Public Policy*, 19(4-5), pp. 313-345. doi: 10.1016/s0278-4254(00)00018-1
- McNichols, M. F. and Stubben, S. R. (2008) 'Does Earnings Management Affect Firms' Investment Decisions?', *The Accounting Review*, 83(6), pp. 1571-1603. doi: 10.2308/accr.2008.83.6.1571
- Mizik, N. (2010) 'The Theory and Practice of Myopic Management', *Journal of Marketing Research*, 47(4), pp. 594-611. doi: 10.1509/jmkr.47.4.594

- Morasch, K. (1995) 'Moral hazard and optimal contract form for R&D cooperation', *Journal of Economic Behavior & Organization*, 28(1), pp. 63-78. doi: 10.1016/0167-2681(95)00020-5
- Mudambi, R. and Swift, T. (2014) 'Knowing when to leap: Transitioning between exploitative and explorative R&D', *Strategic Management Journal*, 35(1), pp. 126-145. doi:
- Mulford, C. W. (2005) *The financial numbers game detecting creative accounting practices*. New York: New York : Wiley.
- Myers, S. C. (1977) 'Determinants of corporate borrowing', *Journal of Financial Economics*, 5(2), pp. 147-175. doi: 10.1016/0304-405x(77)90015-0
- Nabar, S. and Boonlert-U-Thai, K. K. (2007) 'Earnings Management, Investor Protection, and National Culture', *Journal of International Accounting Research*, 6(2), pp. 35-54. doi: 10.2308/jiar.2007.6.2.35
- Nagar, N. and Radhakrishnan, S. (2017) 'Firm life cycle and real-activity based earnings management', *Available at SSRN 2701680*. doi:
- Nawaiseh, M. (2016) 'Impact of External Audit Quality on Earnings Management by Banking Firms: Evidence from Jordan', *British Journal of Applied Science & Technology*, 12(2), pp. 1-14. doi: 10.9734/bjast/2016/19796
- Nelson, M., Elliott, J. and Tarpley, R. (2002) 'Evidence Auditors about Auditors' Earnings Managers' and Decisions Management', *The Accounting Review*, 77, pp. 175-202. doi:
- Nicholson, P. (2009) 'Innovation and Business Strategy: Why Canada Falls Short', *International Productivity Monitor*, (18). doi:
- Nieken, P. and Sliwka, D. (2015) 'Management Changes, Reputation, and “Big Bath”-Earnings Management', *Journal of Economics & Management Strategy*, 24(3), pp. 501-522. doi: 10.1111/jems.12101
- Noussair, C. N., Trautmann, S. T. and van de Kuilen, G. (2013) 'Higher Order Risk Attitudes, Demographics, and Financial Decisions', *The Review of Economic Studies*, 81(1), pp. 325-355. doi: 10.1093/restud/rdt032
- Nusair, N., Ababneh, R. and Kyung Bae, Y. (2012) 'The impact of transformational leadership style on innovation as perceived by public employees in Jordan', *International Journal of Commerce and Management*, 22(3), pp. 182-201. doi: 10.1108/10569211211260283
- Obeidat, B., Al-dalahmeh, M. and Masa'deh, R. (2015) 'The role of knowledge management infrastructure in enhancing innovation at mobile telecommunication companies in Jordan', *European Journal of Social Sciences*, 50(3), pp. 313-330. doi:
- Obeidat, M. I. S. (2016) 'Capital Structure Effect on the Practices of Earnings Management Phenomenon? The Evidence of Listed Firms in Abu Dhabi Securities Exchange', *Asian Journal of Finance & Accounting*, 8(2), pp. 171. doi: 10.5296/ajfa.v8i2.10198
- Obid, S. N. S. and Demikha, L. (2011) 'Earnings management: Islamic perspective', *Asia Pacific Journal of Accounting and Finance*, 2(1), pp. 77-89. doi:
- Olleros, F. and Zhegu, M. (2016) *Research Handbook on Digital Transformations*. Edward Elgar Publishing.
- Omonuk, J. B. (2007) 'Rate regulation and earnings management: Evidence from the US electric utility industry'. doi:
- Osborne, J. W. and Waters, E. (2002) 'Four assumptions of multiple regression that researchers should always test', *Practical assessment, research, and evaluation*, 8(1), pp. 2. doi:
- Osma, B. G. and Young, S. (2009) 'R&D Expenditure and Earnings Targets', *European Accounting Review*, 18(1), pp. 7-32. doi: 10.1080/09638180802016718
- Oswald, D. R. and Zarowin, P. (2007) 'Capitalization of R&D and the Informativeness of Stock Prices', *European Accounting Review*, 16(4), pp. 703-726. doi: 10.1080/09638180701706815

- Othman, H. B. and Zeghal, D. (2006) 'A study of earnings-management motives in the Anglo-American and Euro-Continental accounting models: The Canadian and French cases', *The International Journal of Accounting*, 41(4), pp. 406-435. doi: 10.1016/j.intacc.2006.09.004
- Panda, B. and Leepsa, N. (2017) 'Agency theory: Review of theory and evidence on problems and perspectives', *Indian Journal of Corporate Governance*, 10(1), pp. 74-95. doi:
- Park, Y. W. and Shin, H.-H. (2004) 'Board composition and earnings management in Canada', *Journal of Corporate Finance*, 10(3), pp. 431-457. doi: 10.1016/s0929-1199(03)00025-7
- Pearce, J. A. and Zahra, S. A. (1991) 'The relative power of ceos and boards of directors: Associations with corporate performance', *Strategic Management Journal*, 12(2), pp. 135-153. doi: 10.1002/smj.4250120205
- Peasnell, K. V., Pope, P. F. and Young, S. (2000) 'Detecting earnings management using cross-sectional abnormal accruals models', *Accounting and Business Research*, 30(4), pp. 313-326. doi: 10.1080/00014788.2000.9728949
- Phillips, J., Pincus, M. and Rego, S. O. (2003) 'Earnings Management: New Evidence Based on Deferred Tax Expense', *The Accounting Review*, 78(2), pp. 491-521. doi: 10.2308/accr.2003.78.2.491
- Popa, H. L. (2014) 'Integrative Innovation as Core Determinant for Sustainable Progress', *Procedia - Social and Behavioral Sciences*, 124, pp. 460-467. doi: 10.1016/j.sbspro.2014.02.508
- Popoola, O. M. J., Ratnawati, V. and Hamid, M. A. A. (2016) 'The interaction effect of institutional ownership and firm size on the relationship between managerial ownership and earnings management'. doi:
- Prencipe, A., Markarian, G. and Pozza, L. (2008) 'Earnings management in family firms: Evidence from R&D cost capitalization in Italy', *Family Business Review*, 21(1), pp. 71-88. doi:
- Qamar, M., Shahzad, A. and Masood, S. (2015) 'The relationship between debt financing and reported earnings quality: an empirical analysis of non-financial firms of Pakistan', *Journal of Applied Environmental*, 5(7), pp. 13-19. doi:
- Quttainah, M. A., Song, L. and Wu, Q. (2013) 'Do Islamic banks employ less earnings management?', *Journal of International Financial Management & Accounting*, 24(3), pp. 203-233. doi:
- Radhakrishnan, S., Wang, H., Wang, K. and Zhu, Z. J. (2017) 'R&D Investment and Firm Growth: The Role of Tangible Asset Complementarity', *Available at SSRN 3096806*. doi:
- Rainey, D. L. (2008) *Product innovation: leading change through integrated product development*. Cambridge University Press.
- Richards, R. J. (2003) '4 Darwin on mind, morals and emotions'. doi:
- Ridha, M. and Bajka, D. 2010. The impact of R&D investments on the capital structure of swedish public life science companies.
- Rivest, L.-P. (1994) 'Statistical properties of Winsorized means for skewed distributions', *Biometrika*, 81(2), pp. 373-383. doi:
- Robinson Jr, J. W. and Green, G. P. (2011) *Introduction to community development: Theory, practice, and service-learning*. Sage.
- Ronen, J. (2008) *Earnings Management : Emerging Insights in Theory, Practice, and Research*. Boston, MA: Boston, MA : Springer US.
- Rousseeuw, P. J. and Christmann, A. (2003) 'Robustness against separation and outliers in logistic regression', *Computational Statistics & Data Analysis*, 43(3), pp. 315-332. doi:

- Roychowdhury, S. (2006) 'Earnings management through real activities manipulation', *Journal of Accounting and Economics*, 42(3), pp. 335-370. doi: 10.1016/j.jacceco.2006.01.002
- Saleem Salem Alzoubi, E. (2016) 'Ownership structure and earnings management: evidence from Jordan', *International Journal of Accounting & Information Management*, 24(2), pp. 135-161. doi: 10.1108/ijaim-06-2015-0031
- Salem, R. I. A. (2018) *The relationship between earnings management and voluntary disclosure quality in Islamic and non-Islamic banks: the case of Mena Region*. University of Central Lancashire.
- Samset, K. (1998) 'Project management in a high-uncertainty situation', *Norwegian University of Science and Technology*, pp. 33-76. doi:
- Sasaki, T. (2017) 'Pension accruals and share prices: evidence from the amortization costs of transition amounts', *Asia-Pacific Journal of Accounting & Economics*, 24(1-2), pp. 216-231. doi:
- Schipper, K. (1989) 'Earnings management', *horizons* 3.4. doi:
- Schmidt, A. F. and Finan, C. (2018) 'Linear regression and the normality assumption', *Journal of clinical epidemiology*, 98, pp. 146-151. doi:
- Scholes, M. S., Wilson, G. P. and Wolfson, M. A. (1990) 'Tax planning, regulatory capital planning, and financial reporting strategy for commercial banks', *The Review of Financial Studies*, 3(4), pp. 625-650. doi:
- Seale, C. (1999) 'Quality in Qualitative Research', *Qualitative Inquiry*, 5(4), pp. 465-478. doi: 10.1177/107780049900500402
- Selling, T. (2007) 'Is IFRS Compatible with US-Style Corporate Governance', *Accounting Onion*. doi:
- Semuel, H., Siagian, H. and Octavia, S. (2017) 'The Effect of Leadership and Innovation on Differentiation Strategy and Company Performance', *Procedia - Social and Behavioral Sciences*, 237, pp. 1152-1159. doi: 10.1016/j.sbspro.2017.02.171
- Shaw, E., O'Loughlin, A. and McFadzean, E. (2005) 'Corporate entrepreneurship and innovation part 2: a role- and process-based approach', *European Journal of Innovation Management*, 8(4), pp. 393-408. doi: 10.1108/14601060510627786
- Shon, J. and Yan, M. (2015) 'R&D cuts and subsequent reversals: Meeting or beating quarterly analyst forecasts', *European Accounting Review*, 24(1), pp. 147-166. doi:
- Shu, P.-G. and Chiang, S.-J. (2014) 'Firm size, timing, and earnings management of seasoned equity offerings', *International Review of Economics & Finance*, 29, pp. 177-194. doi: 10.1016/j.iref.2013.05.011
- Shust, E. (2015) 'Does research and development activity increase accrual-based earnings management?', *Journal of Accounting, Auditing & Finance*, 30(3), pp. 373-401. doi:
- Sirbu, A. (2012) 'Economic Value Added (EVA) Approach in Russia. Concepts. Approaches. Instruments', *Revista de Management Comparat Internațional*, 13(2), pp. 305-312. doi:
- Smirnova, M., Naudé, P., Henneberg, S. C., Mouzas, S. and Kouchtch, S. P. (2011) 'The impact of market orientation on the development of relational capabilities and performance outcomes: The case of Russian industrial firms', *Industrial Marketing Management*, 40(1), pp. 44-53. doi: 10.1016/j.indmarman.2010.09.009
- Smith, C. W. and Stulz, R. M. (1985) 'The determinants of firms' hedging policies', *Journal of financial and quantitative analysis*, 20(4), pp. 391-405. doi:
- Soffer, L. C., Thiagarajan, S. R. and Walther, B. R. (2000) *Review of Accounting Studies*, 5(1), pp. 5-26. doi: 10.1023/a:1009643517840
- Sohn, B. C. (2016) 'The effect of accounting comparability on the accrual-based and real earnings management', *Journal of Accounting and Public Policy*, 35(5), pp. 513-539. doi: 10.1016/j.jaccpubpol.2016.06.003

- Solan, R. (1996) 'Do stock prices fully reflect information in accruals and cash flows about future earnings', *The Accounting Review*, 71(3), pp. 298-315. doi:
- Stack, S. and Kposowa, A. (2006) 'The Effect of Religiosity on Tax Fraud Acceptability: A Cross-National Analysis', *Journal for the Scientific Study of Religion*, 45(3), pp. 325-351. doi: 10.1111/j.1468-5906.2006.00310.x
- Stubben, S. R. (2010) 'Discretionary revenues as a measure of earnings management', *The accounting review*, 85(2), pp. 695-717. doi:
- Sun, J., Liu, G. and Lan, G. (2011) 'Does female directorship on independent audit committees constrain earnings management?', *Journal of Business Ethics*, 99(3), pp. 369-382. doi:
- Sun, S. and Anwar, S. (2018) 'Product innovation in China's food processing industries', *Journal of Economics and Finance*, 42(3), pp. 492-507. doi:
- Tabachnick, B. G., Fidell, L. S. and Ullman, J. B. (2007) *Using multivariate statistics*. Pearson Boston, MA.
- Tavassoli, S. and Karlsson, C. (2015) 'Innovation strategies and firm performance: Simple or complex strategies?', *Economics of Innovation and New Technology*, 25(7), pp. 631-650. doi: 10.1080/10438599.2015.1108109
- Teece, D. J. (2010) 'Business Models, Business Strategy and Innovation', *Long Range Planning*, 43(2-3), pp. 172-194. doi: 10.1016/j.lrp.2009.07.003
- Teoh, S. H., Welch, I. and Wong, T. J. (1998) 'Earnings Management and the Long-Run Market Performance of Initial Public Offerings', *The Journal of Finance*, 53(6), pp. 1935-1974. doi: 10.1111/0022-1082.00079
- Thomas, J. K. and Zhang, H. (2002) 'Inventory changes and future returns', *Review of Accounting Studies*, 7(2-3), pp. 163-187. doi:
- Treacy, M. and Wiersema, F. (1993) 'Customer intimacy and other value disciplines', *Harvard business review*, 71(1), pp. 84-93. doi:
- Trejo-Pech, C. J. O., Weldon, R. N. and Gunderson, M. A. (2015) 'Earnings Management through Specific Accruals and Discretionary Expenses: Evidence from U.S. Agribusiness Firms', *Canadian Journal of Agricultural Economics/Revue canadienne d'agroeconomie*, 64(1), pp. 89-118. doi: 10.1111/cjag.12063
- Trejo-Pech, C. J., Weldon, R. N. and Gunderson, M. A. (2016) 'Earnings management through specific accruals and discretionary expenses: Evidence from US agribusiness firms', *Canadian Journal of Agricultural Economics/Revue canadienne d'agroeconomie*, 64(1), pp. 89-118. doi:
- Tsai, K.-H., Hsieh, M.-H. and Hultink, E. J. (2011) 'External technology acquisition and product innovativeness: The moderating roles of R&D investment and configurational context', *Journal of Engineering and Technology Management*, 28(3), pp. 184-200. doi:
- Tumay, M. (2009) 'Asymmetric information and adverse selection in insurance markets: the problem of moral hazard', *Yönetim ve Ekonomi*, 16(1), pp. 107-114. doi:
- Utterback, J. M. and Abernathy, W. J. (1975) 'A dynamic model of process and product innovation', *Omega*, 3(6), pp. 639-656. doi: 10.1016/0305-0483(75)90068-7
- Uyanık, G. K. and Güler, N. (2013) 'A study on multiple linear regression analysis', *Procedia-Social and Behavioral Sciences*, 106, pp. 234-240. doi:
- Väätänen, J., Podmetina, D., Savitskaya, I. and Torkkeli, M. (2011) 'New Trends in Russian Innovations: The Ownership Effect on the Adoption of Open Innovation Practices', *Journal of East-West Business*, 17(2-3), pp. 132-143. doi: 10.1080/10669868.2011.634773
- Vakilifard, H. and Mortazavi, M. S. (2016) 'The impact of financial leverage on accrual-based and real earnings management', *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 6(2), pp. 53-60. doi:

- VanderPal, G. (2015) 'Impact of R&D expenses and corporate financial performance', *VanderPal, GA (2015). Impact of R&D expenses and corporate financial performance. Journal of Accounting and Finance*, 15(7), pp. 135-149. doi:
- Veselovsky, M. Y. (2017) 'Development of venture funding of innovative activities in Russia', *Voprosy regionalnoj ekonomiki*, 31(2), pp. 17-34. doi: 10.21499/2078-4023-2017-31-2-17-34
- Walker, R. D. (1995) *Patents as scientific and technical literature*. Scarecrow Press.
- Walker, R. L. and Florea, L. (2014) 'Easy-come-easy-go: Moral hazard in the context of return to education', *Journal of business ethics*, 120(2), pp. 201-217. doi:
- Walker, R. M. (2014) 'Internal and external antecedents of process innovation: A review and extension', *Public Management Review*, 16(1), pp. 21-44. doi:
- Wallace, D. 2017. *Environmental Policy and Industrial Innovation*. Routledge.
- Wang, C. S., Tung, S., Chen-Chang, L., Lan-Fen, W. and Ching-Hui, L. (2010) 'Earnings management using asset sales', *International Journal of Accounting & Information Management*, 18(3), pp. 237-251. doi: 10.1108/18347641011068983
- Warfield, T. D., Wild, J. J. and Wild, K. L. (1995) 'Managerial ownership, accounting choices, and informativeness of earnings', *Journal of accounting and economics*, 20(1), pp. 61-91. doi:
- Watts, R. L. and Zimmerman, J. L. (1978) 'Towards a positive theory of the determination of accounting standards', *Accounting review*, pp. 112-134. doi:
- Watts, R. L. and Zimmerman, J. L. (1986) 'Positive accounting theory'. doi:
- Watts, R. L. and Zimmerman, J. L. (1990) 'Positive accounting theory: a ten year perspective', *Accounting review*, pp. 131-156. doi:
- Wiedman, C. I. (2009) 'Discussion of "Quarterly Earnings Patterns and Earnings Management"', *Contemporary Accounting Research*, 26(3), pp. 833-841. doi: 10.1506/car.26.3.8
- Williams, M. N., Grajales, C. A. G. and Kurkiewicz, D. (2013) 'Assumptions of multiple regression: Correcting two misconceptions', *Practical Assessment, Research, and Evaluation*, 18(1), pp. 11. doi:
- Williamson, O. E. 1989. Chapter 3 Transaction cost economics. *Handbook of Industrial Organization*. Elsevier.
- Wilson, M. and Wang, L. W. (2009) 'Earnings management following chief executive officer changes: the effect of contemporaneous chairperson and chief financial officer appointments', *Accounting & Finance*, 50(2), pp. 447-480. doi: 10.1111/j.1467-629x.2009.00324.x
- Wold, S., Ruhe, A., Wold, H. and Dunn, I., WJ (1984) 'The collinearity problem in linear regression. The partial least squares (PLS) approach to generalized inverses', *SIAM Journal on Scientific and Statistical Computing*, 5(3), pp. 735-743. doi:
- Xu, R. Z., Taylor, G. K. and Dugan, M. T. (2007) 'Review of real earnings management literature', *Journal of Accounting Literature*, 26, pp. 195. doi:
- Yaari, H., DaDalt, P., Ronen, J. and Yaari, V. (2007) 'On accrual conundrum in earnings management research', *work in process*. doi:
- Yagüe, J., Gómez-Sala, J. C. and Poveda-Fuentes, F. (2009) 'Stock split size, signaling and earnings management: Evidence from the Spanish market', *Global Finance Journal*, 20(1), pp. 31-47. doi:
- Yoon, S. S. and Miller, G. A. (2002) 'Cash from operations and earnings management in Korea', *The International Journal of Accounting*, 37(4), pp. 395-412. doi: 10.1016/s0020-7063(02)00193-0
- Yusoff, H., Mohamad, S. S. and Darus, F. (2013) 'The Influence of CSR Disclosure Structure on Corporate Financial Performance: Evidence from Stakeholders' Perspectives',

- Procedia Economics and Finance*, 7, pp. 213-220. doi: 10.1016/s2212-5671(13)00237-2
- Zahra, S. A. and Covin, J. G. (1994) 'The financial implications of fit between competitive strategy and innovation types and sources', *The Journal of High Technology Management Research*, 5(2), pp. 183-211. doi: 10.1016/1047-8310(94)90002-7
- Zalaghi, H. and Khazaei, M. (2016) 'The Role of Deductive and Inductive Reasoning in Accounting Research and Standard Setting', *Asian Journal of Finance & Accounting*, 8(1), pp. 23. doi: 10.5296/ajfa.v8i1.8148
- Zang, A. Y. (2007) 'Evidence on the Tradeoff Between Real Manipulation and Accrual Manipulation', *SSRN Electronic Journal*. doi: 10.2139/ssrn.961293
- Zang, A. Y. (2011) 'Evidence on the Trade-Off between Real Activities Manipulation and Accrual-Based Earnings Management', *The Accounting Review*, 87(2), pp. 675-703. doi: 10.2308/accr-10196
- Zang, A. Y. (2012) 'Evidence on the trade-off between real activities manipulation and accrual-based earnings management', *The accounting review*, 87(2), pp. 675-703. doi:
- Zarowin, P. and Oswald, D. R. (2005) 'Capitalization vs expensing of R&D and earnings management', *Available at SSRN 739225*. doi:
- Zheng, S. (2019) *Earnings Management and Patenting Disclosures*. Southern Illinois University at Carbondale.
- Zhou, F., Wang, L., Zhang, Z. and An, Y. (2018) 'The impacts of accrual-based and real earnings management on executive compensation: evidence from Chinese public firms in the private sector', *Asia-Pacific Journal of Accounting & Economics*, 25(1-2), pp. 128-144. doi:
- Zhou, J. (2008) 'Financial reporting after the Sarbanes-Oxley Act: Conservative or less earnings management?', *Research in Accounting Regulation*, 20, pp. 187-192. doi: 10.1016/s1052-0457(07)00210-x
- Zmijewski, M. E. and Hagerman, R. L. (1981) 'An income strategy approach to the positive theory of accounting standard setting/choice', *Journal of Accounting and Economics*, 3(2), pp. 129-149. doi: 10.1016/0165-4101(81)90010-0

6. Appendix A : statistics result for earnings management

```
reg TACC_1 term1 term2 term3, noconstant
```

Source	SS	df	MS	Number of obs	=	136,050
Model	1750700.46	3	583566.82	F(3, 136047)	=	15669.88
Residual	5066568.34	136,047	37.2413088	Prob > F	=	0.0000
				R-squared	=	0.2568
				Adj R-squared	=	0.2568
Total	6817268.8	136,050	50.1085542	Root MSE	=	6.1026

TACC_1	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
term1	1933.561	72.81013	26.56	0.000	1790.855	2076.268
term2	.0765817	.0007876	97.24	0.000	.0750381	.0781253
term3	-.345706	.0016326	-211.75	0.000	-.3489059	-.3425061

```
reg TACC_1 term1 term2s term3, noconstant
```

Source	SS	df	MS	Number of obs	=	136,050
Model	1970371.05	3	656790.351	F(3, 136047)	=	18435.37
Residual	4846897.74	136,047	35.6266419	Prob > F	=	0.0000
				R-squared	=	0.2890
				Adj R-squared	=	0.2890
Total	6817268.8	136,050	50.1085542	Root MSE	=	5.9688

TACC_1	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
term1	1739.92	71.21897	24.43	0.000	1600.332	1879.507
term2s	.0853705	.0006739	126.69	0.000	.0840498	.0866913
term3	-.3711224	.0015873	-233.80	0.000	-.3742336	-.3680113

reg TACC_1 term1 term2 term3 term4 , noconstant

Source	SS	df	MS	Number of obs	=	136,050
Model	2105770.55	4	526442.639	F(4, 136046)	=	15201.20
Residual	4711498.24	136,046	34.6316558	Prob > F	=	0.0000
				R-squared	=	0.3089
				Adj R-squared	=	0.3089
Total	6817268.8	136,050	50.1085542	Root MSE	=	5.8849

TACC_1	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
term1	1709.772	70.24752	24.34	0.000	1572.088	1847.456
term2	.0550978	.0007885	69.87	0.000	.0535523	.0566434
term3	-.4605787	.0019405	-237.34	0.000	-.4643821	-.4567753
term4	.5799953	.005728	101.26	0.000	.5687685	.5912221

. reg TACC_2 term1 term2 term3, noconstant

Source	SS	df	MS	Number of obs	=	136,050
Model	189409.265	3	63136.4218	F(3, 136047)	=	7448.26
Residual	1153224.86	136,047	8.47666511	Prob > F	=	0.0000
				R-squared	=	0.1411
				Adj R-squared	=	0.1411
Total	1342634.12	136,050	9.86868154	Root MSE	=	2.9115

TACC_2	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
term1	1320.389	34.73696	38.01	0.000	1252.306	1388.473
term2	.0203129	.0003757	54.06	0.000	.0195765	.0210493
term3	.0491741	.0007789	63.13	0.000	.0476475	.0507008

reg TACC_2 term1 term2s term3, noconstant

Source	SS	df	MS	Number of obs	=	136,050
Model	201653.742	3	67217.9139	F(3, 136047)	=	8014.86
Residual	1140980.38	136,047	8.3866633	Prob > F	=	0.0000
				R-squared	=	0.1502
				Adj R-squared	=	0.1502
Total	1342634.12	136,050	9.86868154	Root MSE	=	2.896

TACC_2	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
term1	1278.501	34.55436	37.00	0.000	1210.775	1346.227
term2s	.0217218	.0003269	66.44	0.000	.021081	.0223626
term3	.0437841	.0007702	56.85	0.000	.0422746	.0452936

reg TACC_2 term1 term2 term3 term4 , noconstant

Source	SS	df	MS	Number of obs	=	136,050
Model	845037.927	4	211259.482	F(4, 136046)	=	57759.70
Residual	497596.197	136,046	3.65755845	Prob > F	=	0.0000
				R-squared	=	0.6294
				Adj R-squared	=	0.6294
Total	1342634.12	136,050	9.86868154	Root MSE	=	1.9125

TACC_2	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
term1	1016.293	22.82916	44.52	0.000	971.5478	1061.037
term2	-.0088805	.0002563	-34.65	0.000	-.0093827	-.0083782
term3	-.1069208	.0006306	-169.54	0.000	-.1081568	-.1056847
term4	.7881274	.0018615	423.38	0.000	.7844789	.7917759

. reg CFO_1 CFO_term1 CFO_term2 CFO_term3, noconstant

Source	SS	df	MS	Number of obs	=	136,051
Model	666939.67	3	222313.223	F(3, 136048)	=	34246.18
Residual	883172.013	136,048	6.4916207	Prob > F	=	0.0000
				R-squared	=	0.4303
				Adj R-squared	=	0.4302
Total	1550111.68	136,051	11.3936074	Root MSE	=	2.5479

CFO_1	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
CFO_term1	-518.9503	30.61524	-16.95	0.000	-578.9556	-458.945
CFO_term2	.0516598	.001968	26.25	0.000	.0478025	.0555171
CFO_term3	-.0068746	.0019632	-3.50	0.000	-.0107225	-.0030268

reg DIXS DIXS_term1 DIXS_term2 , noconstant

Source	SS	df	MS	Number of obs	=	135,953
Model	1592982.2	2	796491.1	F(2, 135951)	=	6064.95
Residual	17854035.2	135,951	131.326987	Prob > F	=	0.0000
				R-squared	=	0.0819
				Adj R-squared	=	0.0819
Total	19447017.4	135,953	143.042209	Root MSE	=	11.46

DIXS	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
DIXS_term1	14945.22	136.7807	109.26	0.000	14677.13	15213.31
DIXS_term2	-.0492862	.0088305	-5.58	0.000	-.0665937	-.0319786

```
reg PROD PROD_term1 PROD_term2 PROD_term3 PROD_term4 , noconstant
```

Source	SS	df	MS	Number of obs	=	90,771
Model	41974127.2	4	10493531.8	F(4, 90767)	>	99999.00
Residual	2758340.55	90,767	30.3892444	Prob > F	=	0.0000
				R-squared	=	0.9383
				Adj R-squared	=	0.9383
Total	44732467.7	90,771	492.805717	Root MSE	=	5.5126

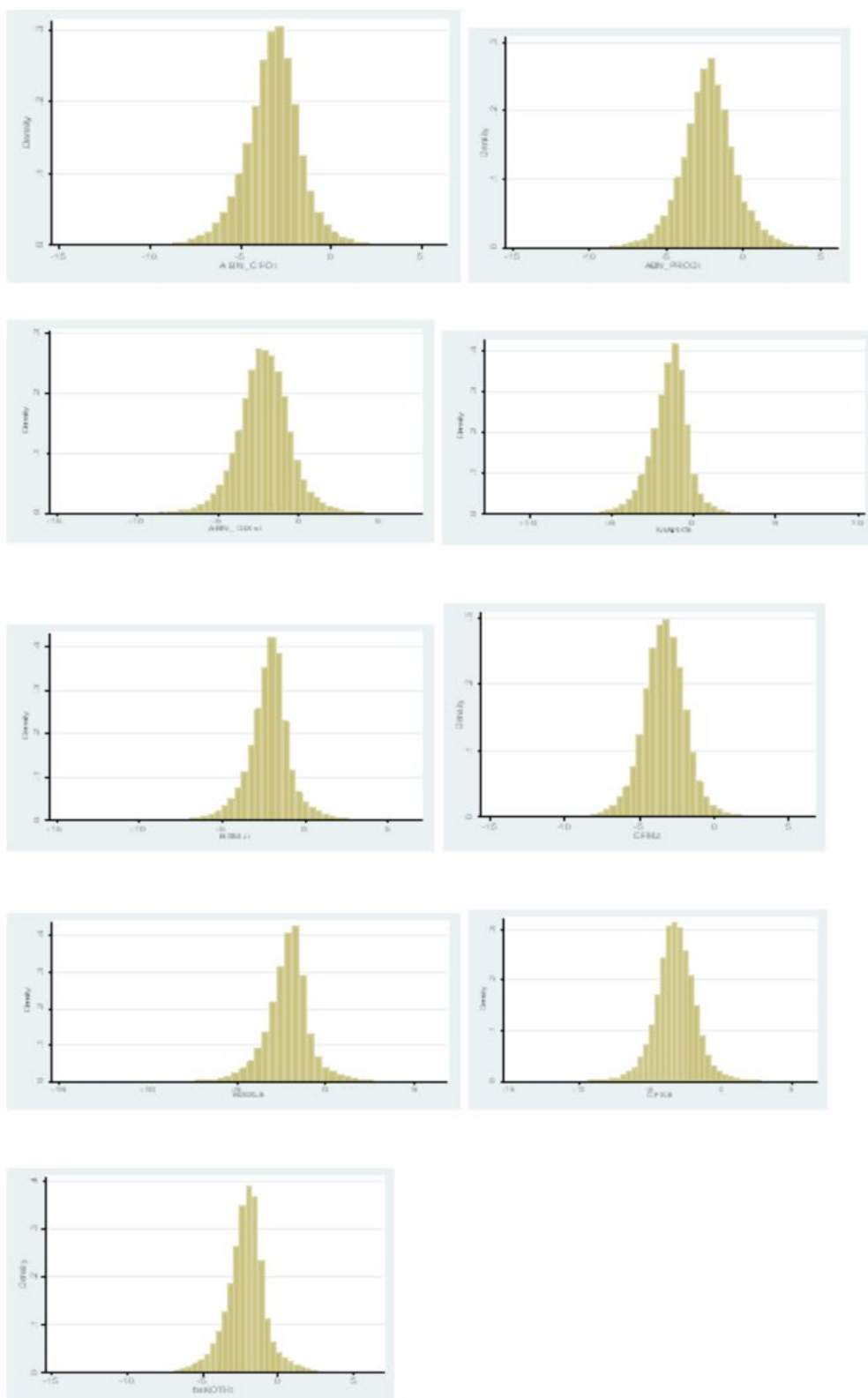
PROD	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
PROD_term1	-618.7803	109.8616	-5.63	0.000	-834.108	-403.4526
PROD_term2	.8395333	.0046128	182.00	0.000	.8304923	.8485744
PROD_term3	-.0022594	.0045685	-0.49	0.621	-.0112135	.0066948
PROD_term4	-.0108018	.0008803	-12.27	0.000	-.0125271	-.0090765

```
.
. reg WAC wac1 wac2 , noconstant
```

Source	SS	df	MS	Number of obs	=	100,869
Model	1662590.69	2	831295.347	F(2, 100867)	=	13031.27
Residual	6434541.65	100,867	63.7923369	Prob > F	=	0.0000
				R-squared	=	0.2053
				Adj R-squared	=	0.2053
Total	8097132.34	100,869	80.2737446	Root MSE	=	7.987

WAC	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
wac1	.2065307	.0018469	111.83	0.000	.2029109	.2101506
wac2	-.4161934	.0133379	-31.20	0.000	-.4423356	-.3900512

7. Appendix B: normality distortion



8. Appendix C: List of Abbreviations

Variable	Definition
SJCF; M1	Standard Jones Model using Cash Flow approach
MJCF; M2	Modified Jones Model using Cash Flow approach
SJBS; M4	Standard Jones Model using Balance Sheet approach
MJBS; M5:	Modified Jones Model using Balance Sheet approach
CFKOTH; M6:	Kothari model using cash flow approach
BSKOTH; M3	Kothari model using balance sheet approach
ABN_CFO; R1	Roychowdhury Model Abnormal Cash Flow
ABN_DIXEP; R3	Roychowdhury Model Abnormal Discretionary Expenses
ABN_PROD R2	Roychowdhury Model Abnormal Production
WCM	Peasnell, Pope and Young (2000)/ Margin mode
IND	Global Industry Classification Standard
ROA	Return on Assets
N	Number of Observations
Coef	The coefficients
T	T Value of Liner Regression
VIF	variance inflation factor
SEC	Securities and Exchange Commission
SOX	Sarbanes Oxley Act 2002
INN; 1	Innovation Firms
0	non-innovated firms
Eco	ECONOMY CLASSIFICATION
DEV	DEVELOPED ECONOMY
DEIV	DEVELOPING ECONOMY
TRA	TRANSITION ECONOMY