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EXAMINATION OF ACCRUAL-REAL EARNINGS MANAGEMENT AND THE FINANCIAL CRISIS

PRESENTED

BY

STEVENSON OMEMU NANDWA

THIS THESIS IS SUBMITTED TO THE BUSINESS SCHOOL IN FULFILMENT FOR THE AWARD OF DOCTORATE OF BUSINESS ADMINISTRATION AT DURHAM UNIVERSITY

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DECLARATION

Statement: I confirm that this piece of work is the result of my own work. Materials from the work of others has been acknowledged, and quotations and paraphrases suitably indicated.

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ABSTRACT

The 2007/2008 global financial crisis caused tremendous economic and financial upheavals with inordinate national and international impact. The economic downturn and shift in the macro-economic landscape seemingly encouraged financiers to invest in what they now consider as ‘’safe’’ assets. The declining liquidity and flight to safety had a fundamental bearing on access to funds by organizations for example small firms were now perceived as being too risky whilst other organizations drew down heavily on existing credit lines as they were anxious that this would be revoked. With the change in perception of risk, firms needed to show resilience and stability and that they were less affected by the financial crisis and thus had healthier prospects and a viable option. Funders were still inclined to invest in organizations with sturdy financial results. This paper hypothesizes that earnings management and the motivation to manage positively the reported numbers would come into focus as managers of firms are now motivated by the incentive to improve their financials to signal to the market that they are ‘’safe’’ to fund and trade with and that they are in a position to service their debt thus avoiding restrictive action on their credit. This research focuses on the costs and benefits of accrual and real earnings management methods and their use before, during, and after the financial crisis periods. It examines earnings management as used by UK-listed firms. The results provide evidence of the use of earnings management methods that is dependent on the size of the firm and its constituent financial constraints. The argument would be that as the supply side of funding declines during the financial crisis and liquidity becomes less available so does the additional and extra need for firms to improve their financial performance so as to attract these limited resources and also avoid paying excess interest charges on the same.

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GDP:	Gross Domestic Product
RTS:	Russia Trading Index
UK:	United Kingdom
US:	United States
SME:	Small and Medium Enterprise
GAAP:	Generally Accepted Accounting Principles
IFRS:	International Financial Reporting Standard
IAS:	International Accounting Standards
CEO:	Chief Executive Officer
SOX:	Sarbanes Oxley Act
SCA:	Corporate Scandal Period
CFO:	Chief Financial Officer
OPEC:	Organisation of Petroleum Energy Countries
CDO:	Collateralized Debt Obligation
TED:	Treasury Euro-Dollar rate
FTSE:	Financial Times Stock Exchange
EBITDA:	Earnings Before Interest Tax Depreciation and Armotisation
AEM:	Accruals Earnings Management
EM:	Earnings Management
REM:	Real Earnings Management
SPSS:	Statistical Package for Social Sciences
R:	Coeffient of Correlation
$R^{2:}$	Coefficient of determination
VIF:	Variance Inflations Factors
ANOVA:	Analysis of Variance
CI:	Coefficient of Intervals
F:	Ratio of explained variance to unexplained variance

T: Test statistics to determine if process has an effect on population interest

D.Accr: Discretionary Accruals

A. Prod: Abnormal production Costs

A.C. Flow: Abnormal Cash Flows

A.D.Expen: Abnormal Discretionary Expenses

+ve: Positive

-ve: Negative

N.O Assets: Net Operating Assets

T. I earned: Times Interest earned

W. Capital: Working Capital

F. Crisis: Financial Crisis

CHAPTER 1:**INTRODUCTION**

The 2007 and 2008 financial crisis that originated from the housing market in the United States and then spread to the rest of the world was a period that exhibited a significant change in economic fortunes for not only large multi-nationals but also for households be it through a decline in the value of home owner's equity as compared to the mortgages or loss of income that occurred from the failure of companies in the financial sectors and beyond. This period exhibited a series of domino effects that initially began from the overheating of the housing market and the advancing of mortgages to customers who were either not creditworthy for the loans or whose homes had a value that was much less than the valuation. Once the homeowners could not service the loans they did not have the recourse of backing these loans through the impaired home values. Furthermore, the banks that had lent the funds had also sold these loans to other financial institutions who now held on to assets worth much less than their anticipated values (Acharya et al (2009).

This impact then spread to other sectors of the economy in the United States and finally to countries all over the world. Investors had lent their excess funds to the United States in the pre-crisis period and were suffering losses while others were now repatriating their investments back to their countries. Governments had to intervene to at least keep their economies afloat and minimize the impact of the recession. The 2007/2008 global financial crisis presented a unique picture in that not only was the stock market in a free fall, but the secondary securitization market was substantially deteriorating with private credit significantly diminished, international trade declined, and prices of certain products such as oil and metals like copper increased substantially. The effects of the financial crisis were not only felt in the United States but extended far and wide for example Europe underwent a debt crisis, the United Kingdom suffered a decline in real productivity. France, Germany, Italy, and Spain experienced declining GDPs. Russia's trading index (RTS) declined by over 50%. Furthermore in the midst of all this were personal stories of families who lost their homes and the general populace who lost their jobs when banks failed and companies were not robust enough to survive the depressing economic conditions.

This dissertation investigates earnings management during the financial crisis. It examines whether firms used accruals or real earnings management during this time of extremely declining liquidity. This enables them to show that they are still financially strong thus a safe bet for investment or to retain their existing debt covenants while for others this was to provide evidence that they had a sound financial strength to obtain new financing as they would be able to come out of the financial crisis much quicker as compared to their peers. The paper hypothesizes that certain companies would need to convince their bankers or financial funders that they are still financially stable hence they can meet their debt obligations and there is no need for further restriction on their credit. I investigate both accruals and real earnings management. I discuss these further in the subsequent literature review and methodology sections. However, for this segment, I provide a background to the study that is the events during the 2007/2008 financial crisis period as well as the motivation of the paper and the research questions that I intend to answer. This introduction section will provide the background and underlying theme for deeper discussions on the use of earnings management. This includes the relevant methods and formulae and the hypotheses behind this research vis-à-vis how the sample and data are analyzed.

I investigate the firm characteristics that apply to these companies that is the size and financial structure amongst others. For example, I examine whether financially constrained firms are more prone to use earnings management as compared to those with better metrics during this time. I use general measures such as interest cover or working capital amongst other characteristics such as operating cycle and net operating assets as accruals earnings management determinants and levels of closeness to bankruptcy as real earnings management determinants. I also include other general variables such as Gross Domestic Product which are variables of interest for this research. This introduction segment will set the stage for further discussions on the earnings management literature and methods in general and then on how they pertain to the financial crisis period. This introduction section will outline the research background. It discusses the financial crisis period and the declining liquidity, the motivation for the study, the questions of interest and the objectives that I set out to achieve and finally the layout and structure of the subsequent thesis chapters.

1.1 RESEARCH BACKGROUND

The 2007/2008 financial crisis period exhibited an unanticipated deep declining liquidity which emanated from the severe losses suffered in the stock market. There was high unemployment thus constraining consumer purchases and spending. Financial institutions were holding on to cash and avoiding lending both internationally and nationally. The investor's perception of risk had changed as compared to the pre-crisis period with some investing their limited funds in what they ostensibly felt were ''safe'' organizations and assets. Others were restricting the credit to their clients and to each other. For example in the pre-financial crisis periods global financial assets had grown to USD241 trillion from USD12 trillion in 1980 (IMF, 2009) with credit default swaps valued at USD60 trillion. This provides a picture of the growth of financial assets either from developed countries or from emerging markets to more advanced financial economies. The IMF (2009) balance of payment statistics show the movement of banking inflows and banking outflows for the advanced economies and emerging economies from the years 2000 to 2009.

Milesi-Ferretti and Tille (2011) note that ''Global capital flows had steadily increased from less than 7% of world GDP in 1998 to over 20% in 2007''.The bullish times experienced a steady growth in international and national liquidity as well as assets of financial institutions that had lent their funds to clients backed by mortgages as security. The increased liquidity and access to easy credit in countries such as the United States then led to a reduction in interest rates and cheap credit not only for businesses but also for mortgage owners. The widely documented NINJA (No Income, No Job, and No Asset) loans created a bubble leading to an augmentation in house prices as demand accelerated. This was further fueled by credit ratings agencies who had a positive assessment of these assets which could then be sold as securities to other financial institutions. Securitization which involved selling mortgage-backed collateral to financial institutions was then resold. This grew significantly during the pre-crisis period. Gorton and Metrick (2012) note that the growth of securitization in the pre-crisis period made it one of the largest capital market assets

Securitization creates a problem in that it seemingly negates the screening and monitoring effect that is conducted in normal loans since the banks would not hold the loans in their balance sheet but would resell them to other financial institutions that would need to effectively screen and

monitor the mortgage clients. In essence, they would rely on the work done by credit agencies whose analysis was fundamentally flawed as they were treating correlated values as independent. Thus the banks with knowledge that they could resell the mortgages would lower their client profiling mechanisms while the financial institutions that would have purchased the securitization believed that the banks had effectively conducted the necessary due diligence. The outcome is that mortgages were advanced to those who were not eligible or able to service the payments. With time these mortgages could not be settled and banks had to foreclose on properties which negatively impacted the balance sheet of the financial institutions that possessed the securitized assets as the underlying assets were now worth less than the loans. As widely documented the impact was quite significant and it led to tremendous financial turmoil and a liquidity crisis. For example, Borio and Disyatat (2010) link these events by explaining in a nutshell that the excess savings and liquidity exerted significant downward pressure on the interest rates which fueled the credit boom and risk taking ‘’thereby sowing the seed of the recent global financial crisis’’.

Miles-Ferretti and Tille (2011) observe that the financial crisis can be viewed in two stages. The first stage of the crisis is from August 2007 to the demise of Lehman Brothers and the AIG bailout while the second stage ‘’coincided with the global panic after the fall of Lehman Brothers that is the last quarter of 2008 and first quarter of 2009’’. During the financial crisis period, small firms or venture capitals faced difficulty in obtaining investments as they were perceived as being risky (Block et al 2010), while other firms that rely on banks now have to draw down on their existing credit lines (Campello et al, 2010)[1]. Furthermore, banks’ lending to their clients and each other declined, however, there is still a relatively limited amount of accessible loans for various firms for example those that can be considered to be large ‘’safe’’ organizations during a time of flight to safety such as this period. The flight to safety can be viewed from two perspectives. Firstly is the evolution of the theory that had existed before the 2008 financial crisis whereby it was accepted based on the previous crisis that when the stock market tumbles drastically then the other sources of funds such as banks and commercial papers would supplement the need for investment. This did not hold as the banks were at the center of the 2007/2008 global financial crisis. Secondly, the funds are repatriated back to developing countries, emerging markets, and to investments such as government securities and precious metals like gold that are deemed to be safe. The flight to safety provided a much more uncertain period for firms seeking funding or maintaining their current debt structures. Kacperczyk and Schnabl (2010) observe that even though commercial papers are viewed as safe assets and a cheap way of raising capital by offering short-term debt at interest rates slightly higher than treasury bills, the financial crisis changed this perception. In the pre-crisis period, they state that ‘’commercial papers was the largest US short-term debt instrument with more than USD1.97trillion outstanding’’.

The 2007/2008 financial crisis resulted in the commercial paper market facing a deep declining liquidity. During this time the investor’s perception of asset-backed commercial papers changed and they were now reluctant to purchase them. Other types of commercial papers faced a decline

[1] *Campello et al (2010) studied the CFO’s corporate spending plans for Europe and Asia, they find that constrained firms in these regions cut back on spending and burnt cash more heavily. They were unable to access external funding hence eschewing positive investment prospects.*

when Lehman Brothers collapsed with shares with a face value of 1 USD now just 97 Cents, thus breaking a common rule in the money market industry. The decline in liquidity was halted when the government intervened and provided deposit insurance, nevertheless, Kacperczyk and Schnabl (2010) note that even though the measures halted a run on the money markets ‘’most funds nonetheless reduced their holding of all types of commercial paper because they deemed them too risky’’. The theory commonly associated with banks as a medium of comfort in the flight to safety period or during a crisis and an avenue through which firms can obtain financing is that when other financial markets are in turmoil banks provide a means through which firms can obtain support and funding. In a period of financial crisis investors flee to safety by investing or saving in what they consider much safer assets such as treasuries or bank deposits. Gatev and Strahan (2006) find that banks are conventionally considered as a haven during a financial crisis thus even though firms may seek to draw down on their credit lines, the banks are still able to meet this demand due to increased deposits.

However, the 2007/2008 financial crisis cast doubt on the theory that banks are a traditional source of financing during a crisis. In this period not only were banks also deeply affected but they were also at the center of the financial decline. Acharya and Mora (2015) state that ‘’this crisis was a crisis of banks as liquidity providers and not just the weakest banks’’. The pressure on the deposit was significant with inflows breaking down. They argue that ‘’the weakness in the aggregate deposit funding position of banks and its sharp reversal following Lehman’s failure is explained by investors perception of greater risk in bank deposits relative to instruments offering similar liquidity and payment services’’. In a period of profound financial turmoil when money is tight, liquidity is declining and investors are fleeing to safety, the firms that are stable and less affected by the crisis and have strong growth prospects are considered to be safe and thus have a higher chance to access the limited available funds while some also avoid tighter restrictions on their current credit lines and also receive positive ratings by analysts. As outlined, the flight to safety emanates from several sources such as funds being returned to developing countries or emerging markets, resources being invested in safe assets, alternatively by the breakdown in financing from commercial papers and banks which leads to a decline in liquidity in the financial system. To access the available limited funds, the financial statements and reported numbers take on a greater significance. The annual reports provide a means to communicate to the parties such as the investors and financial markets on the strength of the company. Managers of firms across the board have the motivation to manage earnings to signal to the market that they are less affected by the crisis and thus are stable and still a strong viable option for financing. For all firms, the funding needed during this time could be the difference between remaining in business or closing down, the stakes at these times are high. Earnings management provides a tool that firms can use to achieve their objective in this period[2].

[2] *This paper studies the financial crisis and declining liquidity which resulted in the need for earnings management, however, it is important to point out that the data and analysis are not only restricted to financial firms but companies across various sectors and industries as listed in the London Stock Exchange FTSE ALL Share index.*

Earnings management to improve financial performance is an avenue through which managers can manipulate the numbers when certain incentives such as to increasing their bonuses or obtaining tax relief are compelling enough. They can do this by either using the freedoms allowed by accounting standards that is accruals earnings management or deviating from normal operations also known as real earnings management. This research investigates earnings management (EM henceforth) in the periods surrounding the global financial crisis and the declining liquidity facet with an analysis of accruals earnings management (AEM henceforth) and real earnings management (REM henceforth). Other papers that have also researched in this area however this study's methods and technique is distinct to previous papers which even though they have examined EM during the financial crisis they mainly view this from one perspective. This analysis observes the phenomenon on both fronts that is from the supply side of liquidity and the declining effects and then on the demand side of this financing that constrains firms from accessing credit with further restriction on existing debt covenants. Additionally, most of the previous papers have only used AEM and not compared this to REM. I provide a deeper discussion on the contribution and distinctness of this paper in the literature review with a section purely dedicated to this.

Previous studies on EM during the financial crisis have mostly not included REM into the equation therefore even though in some countries previous papers find that AEM declines due to the necessity for improved quality of financial reporting. The declining liquidity and need for funding or to avert restrictions on existing debt covenants may provide too much an incentive for managers and firms to attempt to signal to the financial market their ongoing sturdy performance. I therefore hypothesize that REM would still provide a viable option at this time. The argument would be that as the supply side of funding declines during the financial crisis and liquidity becomes less available so does the additional and extra need for firms to improve their financial performance so as to attract these limited resources and also avoid paying excess interest charges on the same. I discuss the financial crisis period, declining liquidity, and the implications for EM in the literature review section. A few studies have managed to use REM however not in the same line as this study which is UK firms and methods that is time trend analysis. An example of one paper that has used both methods was done on Chinese (Xu et al 2016) firms but in a different setting from this paper which is on UK-listed firms. This paper has dissimilar statistical methods from Xu et al (2016)[3] in that whereas they use both AEM and REM, I use time trend analysis over the sample period while also examining the firms separately, segmenting between the positive and negative residuals for those with increased and decreased AEM and their REM equivalent. I provide further discussion on this in the methodology section.

The UK environment experienced a different response from the government as compared to China. The stimulus-response by the UK government was more or less the same as that of other Western countries as the immediate answer to the financial crisis. Whereas the UK government instituted packages which were aimed at avoiding the collapse of the banks as well as to increase

[3] Xu et al (2016) study use least squares regression for the absolute values to examine earnings management in Chinese firms. They use both accruals and real earnings management. They find that construction firms and those in the airline industry increased earnings management in this time. This paper uses absolute values for descriptive statistics same as Cohen et al (2008).

consumption and inject the needed impetus to resuscitate the economy, the Chinese government's stimulus package was aimed at investment focusing on infrastructure construction (IMF 2010). The funds from the Chinese government were directed to the regional governments and were used for road or railway construction as well as other infrastructure development. The Chinese government later on introduced other tax cuts and subsidies to boost consumption. The UK government introduced measures such as the nationalization of banks to stabilize the banking system and other actions such as tax cuts and lowering interest rates to increase consumption instantaneously. Xu et al (2016) find that there is increased AEM by construction-related and airline industries in China during this time. They also find evidence of a decline in AEM in the household durable industry. They explain this to be as a result of the need to attract the funds that the Chinese government was offering to these sectors. On the other hand, the UK government's intervention was to appeal to a wider section of industries in the economy. This paper therefore investigates the decline in liquidity during this financial crisis time and the impact of financial reporting by UK-listed firms as the impact has a broader and wider representative as compared to the Chinese firms that would be affected by stimulus to revive construction whereas the tax and interest rates cuts in the UK would influence widespread and more inclusive firms.

Admittedly the stock market had suffered tremendous losses and the various governments were injecting substantial cash into the banking system and the commercial paper market. There were still several reasons as to why this did not eventually lead to increased lending thus deviating from previously held theories that the banking system could provide secondary liquidity in the event other markets such as the stock market suffered tremendously in a recession or a financial crisis. The government intervention at this time did not necessarily provide sufficient cash that would reset the financial system and lending to the pre-crisis level thus restoring the much-needed access to capital. EM is a concern during this period not only for financiers but for other parties such as accounting regulators and government agencies. I discuss further the declining liquidity aspect in the following section and why this was the case despite the necessary government intervention and policies that were initiated at this time.

1.2 LIQUIDITY DURING THE FINANCIAL CRISIS

This research seeks to link the supply and demand side of the financial firms that provide liquidity and corporate organizations seeking funding. It is important to point out from the outset that this research involves UK data and focuses on firms in various industries and not just financial firms. The paper establishes based on previous research whether there is an actual decline in liquidity and investment during the financial crisis and how firms seek to maintain or attract this financing by managing their earnings to portray an image of stability and show a strong performance during the financial crisis. The decline in financing could be from financial institutions such as the stock market or banks or even from suppliers and buyers by means of reduced sales and trade credit. Several papers have been written on the difficulties faced by banks during the financial crisis. These include Acharya et al (2017) who found that commercial and investment banks were negatively impacted by the toxic financial instruments which affected their solvency thus resulting in decreased lending. Certain banks ultimately collapsed while some were saved through government intervention and others were forced to merge. In addition to banks other investors

were reversing the movement of funds from developed financial markets to asset purchase programs (TARP), Bebchuk (2009) observes that this intervention limits the costs to the tax payer while at the same time providing stability to the financial system. Gorton et al (2004) also note that when there are inordinate assets to be purchased that private markets are unable to handle then the government bailout by purchasing these assets is a much more feasible route.

Even though the various governments stepped in to try and help inject cash back into the financial system, ultimately the supply side of financing was still depressed. One of the reasons as noted by Brei et al (2013) is that financial firms used government funds to restore their capitalization levels. They argue that government injection of liquidity into the financial system may not necessarily result to increased credit supply to organizations seeking financing until the bank's balance sheets are adequately strengthened. The recapitalization is necessitated in that it aids banks in two aspects. Firstly it averts extreme distress thus enabling banks to survive the financial crisis and see another day while second is to regain their adequate capital ratios. Bank's lending and capitalization differ between normal and crisis times, the crisis period exhibits increased marginal effectiveness that is the rate of return expected from additional invested capital. Capitalization takes precedence then once this is established the additional funds can be lent to clients. The banks therefore can only turn to increased lending once capitalization transcends beyond a certain threshold. During the financial crisis period, the net effect of this is for banks that are undercapitalized seeking to regain an acceptable level of capital ratio as established by the regulators is important before they can resume lending to the market and their clients.

Gorton et al (2004) provide a dichotomy between the liquidity and capitalization effects of the financial crisis. Whereas a capitalization problem involves a decline in the bank's assets as reflected in their balance sheets. A liquidity crisis encompasses a need for cash resources by banks. Therefore a bank bailout not necessarily by cash injection by purchasing assets may not provide the solution if banks are faced with a liquidity predicament furthermore if deposits are declining from retail and corporate clients. Other papers such as Ivashina and Scharfstein (2010) observe that there is a decline in new loans during the financial crisis however banks still provide financing to firms that seek to draw down on their credit lines if these agreements had existed before the financial crisis. Borio et al (2010) also note that even though there may be government intervention during the financial crisis to inject cash into the financial system this may not lead to increased lending as the banks may use these funds to restructure their financial operations. This is especially necessary during this time as it enables them to be ready for when the economy recovers when they will need to be self-sustaining and able to take advantage of opportunities that may arise.

Borio et al (2010) state that one of the problems that is solved by banks during restructuring in the financial crisis is the issue of ever-greening and correcting earlier excesses in the pre-crisis period. Even though recapitalization programs were at the core of the government rescue packages that would enable banks to withstand the financial pressures exerted on them during the financial crisis there were other programs initiated by governments to save the banks. These included debt guarantees or deposit insurances to avert further runs on the banks as well as address funding requirements and avoid solvency issues. One difference between the recapitalization programs and these other interventions is that these were more or less standard terms that cut across the banking

system unlike, the recapitalization process which was tailored to suit the specific bank's requirements. One other notion for the decline in bank lending despite government measures is that there was a changed perception of risk with bank deposits now deemed to be of increased risk thus banks were facing declined deposits which also meant a reduced amount of funds available for lending. Another simple explanation could be that the decline in lending by banks was generally due to the state of the economy at the time which was also depressed consequently when economic indicators such as unemployment increased with firms also cutting back on investment and spending then on the same note the bank's lending would also decline.

The negative effects of the falling economy during the financial crisis does not only affect the banks and financial institutions that provide funding but also the firms that need liquidity and investment be it for daily operations or for capital expenditure. As the supply side of funding declined the demand side also experienced tremendous pressure during this time of a deeply contracting economy. Firms faced inordinate pressures during the financial crisis, organizations have diminishing sales and declining demand. For example, a decrease in trade of capital-intensive goods which is even more pronounced in certain regions of the world such as Europe where there is a stronger link between the financial markets and the supply chains. Additionally, in a financial crisis, a cocktail of negative events provides a depressing operating environment for companies. These include high unemployment thus reducing the purchasing power of customers, shrinking production and consumption, and in the end declining price levels with increased discounts to attract customers. This situation provides working capital pressures not only for the firms themselves but also for their eco-system. Companies are also in a precarious position in that the debtors may delay in settling their invoices. Furthermore, the firms and their supply chain also have difficulty securing working capital funding, which could result in an inability to purchase the needed inputs. For example in the automotive industry, firms that assemble vehicles found themselves in a position where part makers were unable to supply the parts. The net effect is that they interrupt the production processes.

Financially strained suppliers who are plagued by tight credit markets and pressure on their working capital or higher costs of certain commodities may also be inclined to avoid distributing their products if they fear that their clients will not be in a position to finally sell the completed products which in the end means that they will not honor the invoices for the inputs provided. This scenario makes it difficult for companies to finance part of their operations through accounts payable. When supplier firms are unable to get paid for their invoices or when the recipient organizations cannot obtain inputs for their production as suppliers do not have adequate stock then this situation destabilizes the trade credit position for firms. Trade credit allows firms to buy and sell with each other without paying by cash this provides a form of financing. Trade credit has a variety of benefits to a business one of these is that it is an easy form of financing with less hassle compared to the other interim support mechanisms such as overdrafts or loans that would be needed for the firm or business to have a certain level of credit rating so as to qualify. It is also easily maintained and does not need much scrutiny for example from lawyers or other professionals. It is also a fairly cheap form of finance in that there are no interest costs on the other hand it provides benefits of discounts in case payment is done before the stipulated or agreed

payment period. Delayed payments could therefore be viewed as a form of interest which then enthuses firms to settle their invoices promptly.

Petersen and Rajan (1997) in investigating the concepts around trade credit find that firms with limited access to the capital markets result in trade credit as a means of financing. In their analysis medium-term financing via trade credit is normally a last solution when other financing methods are restricted, on the other hand, short-term financing by trade credit is normally used to reduce transaction costs. Additionally, suppliers will use trade credit to be able to obtain information about their buyer's and also enable them to have some sort of equity stake in the buyers firms. They also observe that firms with the ability to obtain credit from financial institutions also offer greater trade credit than those that do not. Carbo-Valverde et al (2016) note that trade credit is essential for small and medium-sized organizations that do not have access to bank loans, they observe that in the US trade credit to SMEs provides as much or equal to bank financing. This view is supported by Berger and Udell (1998) who find that trade credit accounts for 31.3% of all loans to SMEs in the US as compared to 37.2% for bank loans. However during the financial crisis when the economy is vulnerable and the market uncertain the perception of risk is altered which makes it much more difficult for firms to use this form of financing.

Carbo-Valverde et al (2016) observe that in normal times SMEs undoubtedly rely on trade credit as a means of finance, it becomes much more difficult during a financial crisis. This is evidenced in constrained firms such as those with low working capital or high interest and low profits. However unconstrained SME firms will still rely on bank loans and will draw down on their existing credit lines which is much more expensive. The negative impact of this is that trade credit is more or less free financing as interest is not charged but payment is deferred to a certain date maybe 60 days or 90 days thus when this is curtailed by suppliers the firms will need much more liquidity and may now have to either reduce credit to their customers or if this is not viable then obtain interim financing from their banks such as drawing down on their credit lines. Firms obtain discounts on prompt payment or settlement before the stipulated time, failure to settle obligations on time will lead to increased costs which can amount to some form of interest that would negate the benefits of trade credit. Lee et al (2018) find that '' When suppliers offer trade credit at their industry-average level, this action facilitates trade which is positively associated with both parties' performance; the converse is observed when suppliers are more aggressive in their trade credit strategy than the industry average''. Therefore as long as trade credit is offered within the industry average then it is positive for businesses.

During the financial crisis as the supply of liquidity declined from either the capital markets or financial institutions like banks together with internal sources of funding from trade credit, the demand for financing increased as firms needed to weather the storms initiated by the financial crisis. Organizations were in a difficult position to show that they were still strong and were navigating the economic downturn much better than their competitors which would then enable them to either access new funding or maintain their existing credit facilities without further restrictions on their debt covenants. Even though the financing needs and demand for credit vary depending on the firm's size, age, ownership structures, industry, and asset base there are various reasons why organizations in general require financing. These include to purchasing new

equipment, paying suppliers on time, expanding to a new branch or internationally, to covering cash flow shortfalls thus enabling certain liabilities such as utilities or government statutory payments to be settled on time. This demand for financing is more pronounced during the financial crisis period. For example at this time demand is slower than normal thus businesses need interim financing to bridge the working capital gaps. Additionally, the decreased demand also impacts the ability to collect accounts receivable on time as clients are also facing the same negative economic conditions or even worse. Fazzari et al (1988)[4] in their seminal study find that financially healthier companies can raise funds much more easily than their financially weak counterparts. There is a constraint faced by financially weak companies in accessing the capital markets. By inference, the belief would be that during a financial crisis when certain firm's performance is weak, their constraints in accessing funding will be much more distinct which could lead to the denial of loans or greater restrictions on their existing credit facilities. The liquidity issue takes on a greater importance.

1.3 FINANCIAL REPORTING DURING THE FINANCIAL CRISIS

Admittedly some firms still do well during the financial crisis and others that benefit during this time. An example is companies that provide essential services such as health care or cleaning services that will be less affected by an economic recession as the general public will still require their services even at a time of economic upheaval. They may even benefit during the economic recession times as the general public will spend more on essential items or stock up on the same due to the economic uncertainties. On the other hand, companies that provide luxury or non-essential products or services such as holidays or high-end products will be more affected at this time. The financial needs for both types of firms that is those not impacted by the financial crisis or the ones that seemingly benefit and those negatively affected will be different. Firms that are less impacted by the crisis will need financing for expansion to take advantage of increased market opportunities provided by their clients who may be changing their purchasing habits from non–essential to essential products, they will also require financing if assets are being sold at heavily discounted pricing which they feel they need to be able to meet the increased demand. They may also find that this would be the best time to acquire certain companies that offer services or products complementary to theirs or which they could work with for strategic reasons. The reduced price or valuation provides an incentive for the purchase either from internal funds or from external debt. On the other hand, the firms which are experiencing an impaired performance will require funds to be able to meet short-term or medium-term demands such as for salaries and wages, purchase of inputs or for repairs and maintenance. There will also be similarities between the various firm's financial needs an example is to be able to safeguard themselves from the uncertainty and unpredictable business environment. Firms be they those performing well or not

[4] *Unlike empirical models and business finance pecking order that state internal forms of finance are the first port of call followed by external capital, Fazzari et al (1988) use market imperfections which then suggest that this ''financial hierarchy'' will not hold for firms that have restrictions in accessing external sources of finance. These firms would then not be able to adjust their investment decisions to respond to changes in the market such as cost of capital, asset prices, and tax-based investment incentives.*

will need to ensure that their credit lines are still open and that their debt facilities with financial institutions are not deactivated or new constraints introduced. Some companies simply draw down on their pre-crisis level credit to cushion themselves in the event any unforeseen or unplanned cash outflow becomes necessary during this time.

The financing needs to make financial statements take on much greater importance during this period. Unlike normal times, a financial crisis-era is much more critical as firms that do not receive funding may have limited options be it internal from trade credit or even from the government which would ideally be injecting funds to financial institutions such as banks and not to specific businesses unless these firms had particular characteristics to the people and economy. Firms would therefore have to show the financial institutions that they are still a safe bet for investment and credit. One of the ways through which they can do this is by improving their financial performance as would be evidenced in their annual reports. In the same vein financial institutions would increase their screening and monitoring of organizations seeking credit. This would mean a greater review of financial statements to ensure that there isn't a dilution in the quality of reporting as there would be an anticipation of such practices during this time and firms would find the incentive appealing. The accounting regulatory bodies are also much more vigilant at this time as evidenced during the post 2007/2008 financial crisis when new regulations were introduced to improve financial reporting (Arthur et al,2015). Firms would therefore look for avenues through which they can augment performance but at the same time avoid the consequences that arise from regulators punishing poor quality reporting or flouting accounting reporting guidelines. Repercussions for reporting below the required threshold could be companies being fined or issued with rectification notices from the regulators.

Arthur et al (2015) observe that there is improved reporting quality during the financial crisis period. They observed that there was a significant concern on the quality of financial reporting during this time. The accounting standard-setting bodies and capital market regulators were aware that during the economic recession firms would have great incentives to improve their financial performance. They find that of the 14 European countries sampled during the years 2007 to 2009 they tended to ''present higher quality financial reports during the financial crisis than the periods prior to it''. Cimini (2015) also in a study of EM during the financial crisis of firms in the European Union concurrently find that there is high-quality financial reporting during this time as firms seek to attract potential investors whilst at the same time appeasing the standard setters and regulators. These findings do suggest that in a bid to increase investor confidence and meet the regulatory reporting requirements during the financial crisis period, managers would improve the quality of their financial reporting at this time.

Some of the regulations enacted prior to and after the 2008 financial crisis include the migration from the local GAAP to International Financial Regulation Standards (IFRS) in Europe. These regulations for example required companies that trade publicly in the EU to prepare their consolidated financial statements as of 2005 and thereafter under the IFRS regulations. This movement intended to create a similar consolidated reporting structure in Europe which would improve comparability of financial statements. At the same time, the regulations would ensure greater transparency and accountability amongst firms trading in Europe. Studies such as

JermaKowicz and Gornik-Tomaszewski (2006) observe that this transition was the most significant change in European financial reporting standards ever witnessed in the last 30 years. In the US several regulations were also introduced in the wake of the 2008 financial crisis. These include the Dodd-Frank Act in 2010 which now amended numerous other guidelines while introducing certain new standards such as the Consumer Protection Bureau. Other post-financial crisis regulations in the US include the Emergency Economic Stabilization Act and the Housing and Economic Recovery Act. Just like in Europe, these regulations were meant to improve transparency and accountability among firms and financial institutions thus restoring much-needed confidence. For example, the Housing and Economic Recovery Act improved the requirements for financial institutions to disclose on mortgages which had been a fundamental driver of the financial crisis.

IFRS project in May 2011 and updated in 2012 states that ''the global financial crisis illustrated that the existing consolidation guidance was not fundamentally flawed but could be improved. Moreover, the global financial crisis highlighted the need for new disclosure requirements to provide users with better information''. In this regard, the accounting regulator instituted an exposure draft in 2008 which resulted in the combination of '' disclosure requirements for interest in subsidiaries, joint arrangements, associates and unconsolidated structured entities into a separate comprehensive standard. IFRS 12''. Whereas IFRS 10 encompasses consolidation that recognizes control as the basis for consolidation, IFRS 12 requires the entities to disclose information which enables the users and stakeholders to assess the financial effects and nature of the reporting entity's relationship with other entities. These two standards were now effective from 1st January 2013 however firms were permitted to apply them earlier if they were able to. These two reporting standards were part of the response to the financial crisis and were consistent with the US national standard setters, the Financial Accounting Standard Board (FASB) as well as being consistent with the G20 leaders, the Financial Stability Board and other accounting and disclosure requirements. IFRS provides a timeline that shows that there were reviews of consolidation standards which began in 2003 and was implemented in 2005, thereafter in 2008 there were reviews to improve reporting on consolidation that was eventually implemented in May 2011.

As already noted these amended or new guidelines compounded the increased surveillance by the regulators on companies that provided an environment of enhanced reporting quality as managers were aware that the spotlight had been cast on business and these would be heightened if it was established that their financial reports were not of the accepted standard or in line with the outlined framework. The hypothesis therefore as will be discussed later in this thesis is that this would limit the use of AEM. Another reason found for improved earnings quality is to attract high-quality investors. Verdi (2006) observes that even though there is a general underlying belief that financial reporting quality improves investment efficiency, he notes that there is little empirical data and evidence to support the same. In his analysis, financial reporting quality is ''more strongly associated with overinvestment for firms with large cash balances and dispersed ownership, which suggests that financial reporting quality and underinvestment (overinvestment) is mainly driven by the innate (innate and discretionary) component of reporting quality''. He also finds that in a low-quality information environment, the firms with improved reporting quality have a stronger investment efficiency thus investors anticipate a greater return on investment from these

organizations. There is therefore still an incentive for some firms to improve the quality of reporting at this time to increase investment, The financial funders who would have access to financial statements would reciprocate and reward exceptional reporting with less stringent covenants, the argument however would be that they would then segue to REM if the AEM environment is restricted or not viable. Thus EM would still be an option depending on the nature of the firm.

1.4 RESEARCH MOTIVATION

This paper is motivated by the deep declining liquidity during the financial crisis period and the need for firms to obtain funding during this time. The study is interested in how financial reporting and EM enables firms to improve performance during this time thus signaling to the market that the firm is still strong. Previous studies showing a decline in the use of EM methods by manipulating the financial statements were mainly based on AEM and did not involve REM. Admittedly there are a few studies that have used REM during the financial crisis however these are not within the same scope and breadth as this paper. I discuss this further in the literature review section. Additionally, even though they acknowledge the decline in liquidity there is a lacuna in investigating the aspects of this declining liquidity and EM and how this differs in firms of different sizes that is whether this is observed in large, medium-sized, or small-firms and how firms that have existing debt improve reporting to avoid restrictions on their financial commitments or those that require funding can attract investment. Furthermore how the various firm characteristics affect their financial reporting. The counterarguments of previous papers could be on two fronts, firstly by improving the quality of reporting firms may depress their financial results which could impact their ability to obtain credit or they would attract greater restrictions on their existing debt covenants. The second dissenting view would be that firms would still have an incentive for EM during this time therefore if AEM declines during a recession due to increased monitoring by standard setters and regulators then management would seek other methods such as REM which is within their mandate and does not involve manipulation of financial reporting thus much more difficult to detect.

Bornermann et al (2012) investigate financial firms in Germany from 1997 to 2009. They observe concealed reserves that enable them to support the increased earnings. This research does not necessarily investigate EM within financial firms or the extraction of data to independently examine the declining liquidity however I use previous papers and their empirical approach and findings to support the premise that there was a declining liquidity during the financial crisis period. I investigate the EM arena around this period and extend the work done in previous studies by investigating whether the decline in the supply side of liquidity leads firms to substitute REM for AEM. The study will provide a brief discussion of the declining liquidity as well as provide empirical evidence from previous papers on the same. I then analyze EM during the financial periods and whether there is actually an increase or decrease in either form of EM method if size and financial constraints play a role and finally what are the firm's characteristics for the companies that engage in either EM method. The motivation for this thesis is to establish whether the general negative economic environment and the constraint in obtaining funding during the

financial crisis period provides an actual incentive for firms to use EM and the nature of organizations that would gravitate to this methods.

1.5 RESEARCH OBJECTIVES

As already discussed the motivation for the research stems from the need to understand further the company's engagement in EM during the financial crisis. The questions posed enable us to understand whether there is a decline in liquidity and how firms use EM to augment performance as I hypothesize that there is an incentive for this. It is also important to mention briefly the objectives and ultimate purpose of the study and how it is of benefit to accounting practitioners, regulators, standard setters, academics, and the general public. This is to enable us to understand the value of this research as it pertains to the various stakeholders. Admittedly we may not be able to predict how a future financial crisis will occur and whether it will be of the same nature. For example there was previously a public health pandemic that is COVID-19 that spread throughout the globe which caused a tremendous economic degeneration in nearly all countries and lead to significant financial deterioration in firms especially in the travel and hospitality sectors due to the restriction of movement and set out social distancing guidelines that had been recommended by governments to avoid a further spread of the virus. Even though the origin is different that is a health pandemic, the outcomes and effects as evidenced are similar to the 2007/2008 financial crisis which began with the collapse of the housing market. The consensus is that a financial crisis is a period of significant liquidity deficit with companies either just surviving the period and some not able to continue trading due to the lack of finances or deep economic stagnation. In essence, the research will be of some help in not only understanding the previous financial crisis but also providing a framework for studying EM in future periods of significant economic decline.

The outcomes of this research is of importance to accounting practitioners to better understand the nature of accounting operations and reporting during the financial crisis. An analysis of AEM and REM during the financial crisis enables accounting bodies to introduce new regulations based on how firms manipulate discretionary accruals. Previous reporting guidelines have been introduced post various financial crises for example after the 2007/2008 financial crisis. One of the reasons is that the standard setters are much more aware of the type of accounting misrepresentations thus are able to act however this paper provides further insights that can be a point of reference when there are deliberations on EM during a financial crisis or a period of severe economic decline. It is also of benefit to investors and shareholders who may need to be mindful that even though there may be a decline in AEM during this time firms may substitute this for REM which destroys value in the long term hence they need to be conscious and hold management accountable through for example requirements for disclosure of certain change in operational activities. I provide greater details on the costs and benefits of AEM and REM in the literature review. It is also accepted that reputable financial institutions would have measures in place to analyze EM and would be able to detect certain manipulation of financials however this may not be the case for other less well-established financial institutions.

The research is also of interest to academics in understanding the dynamics of EM in a financial crisis, the research methodology and design provide a structure that can be refined to study future

events such as the Coronavirus pandemic and its impact on liquidity vis-à-vis EM. The paper can also be extended to study the same phenomena in other crises such as the Asian financial crisis or the Latin American debt crisis. A financial crisis period is a time like no other thus studying EM under these uncertain conditions when the incentives are great or the risks are so excessive is of benefit in extending our knowledge of EM. There is a thin line between the successes or failure of a business this becomes much more important in the financial crisis period with negative macro-economic factors at play. EM at this time is of interest to academics and accounting researchers. This study is also of benefit to financial institutions that appraise their clients during the financial crisis either for new financing or to restructure their debt during this time. Finally, the research is of importance to the general public. The paper enables the public such as employees to understand the nature of their company's financial reports and decide if the performance is not out of a true underlying performance but augmented by various EM tools thus making decisions whether to maintain their employment or seek for other opportunities. The study can also be used by suppliers who provide services to firms to analyze their clients during this time and decide whether to increase the trade credit or restrict this to a less extent or even trade on cash terms if the financial performance has been considerably improved by EM. In general, I have confidence that the paper is of importance to various practitioners and the results showing either an increase or decline in AEM or REM of certain firms is useful to assist various stakeholders in making their respective decisions.

1.6 RESEARCH QUESTION

This paper seeks to answer specific questions, these including the nature of financial reporting at this time, what is asked is if there is an increase in EM and in that sense if managers segue from AEM to REM, and the nature of the firms that engage in either of these EM methods. The research stems from various over-arching themes such as the decline in the stock market and commercial papers as well as trade credit. Another basis for the decline in liquidity is that even though there was government intervention this did not lead to increased lending by the financial institutions. I provide empirical evidence for this that is established from previous papers. Additionally, with the decreased lending there is now competition for limited funds amongst firms that need funding during this critical time. The research asks the questions:

- *Do firms engage in EM as a possible option to improve performance and therefore attract limited investment for their various needs or maintain their current debt covenants thus avoiding restrictions?*
- *What are the nature of the firms that engage in EM based on size and financial constraints and what are the distinct AEM and REM characteristics of the firms that use these forms of EM?*

These two questions provide a further understanding of EM during the financial crisis from a dissimilar perspective than previous studies which have also investigated EM during this time.

Iatridis and Dimitras (2013) investigation on European firms found that there is an increase in AEM for firms in Portugal, Italy and Greece listed firms. They explain that this is due to their increased debt levels, they therefore need to improve their profitability. The inverse applies to

corporations in Ireland. They note that during the financial crisis, the EU debt crisis provided an environment in which there was a reduction in industrial output, a decline in GDP, and less spending by the citizens hence a depressed liquidity for firms. This environment would ideally cast doubt on the integrity of financial statements in Europe as it provides a compelling incentive for EM. They focus on whether there is an increase in EM within the five European countries or if the inclusion of amended IFRS standards provides sufficient safeguards against this. Their research viewpoint is on the accounting behavior of EU firms vis-à-vis IFRS standards as well as the impact of big four auditors on this. There are certain differences between this study and the one by Iatridis and Dimitra (2013). Firstly even though they acknowledge that firms have debt pressure they do not provide an analysis of this which I attempt to do. Secondly, their study does not dichotomize the firms between those with these financial constraints and the ones without which I endeavor to do by involving the use of the ratios such as interest cover and other working capital measures to be able to measure EM movement that is specific to the firms with elevated debt levels. Thirdly this study introduces an additional EM methodology by investigating whether firms also use REM when the AEM method has been restricted or reached its limit. I provide further knowledge and answers to the research questions surrounding EM during the financial crisis.

Other studies of EM during the financial crisis find that there are also persuasive reasons for firms to improve the quality of financial reporting during this time. One such study is Arthur et al (2015) who show that ‘’accounting standard-setting bodies and regulators of the capital market showed great concern regarding financial reporting policy’’. In their assessment there would be strong restrictions and vigilance from the regulators that would hinder firms from using EM. This would lead to improvements in earnings quality during the financial crisis period, their findings also support this view with a conclusion that firms tend to improve earnings quality during this period. Another study by Cimini (2015) observed that in a majority of European countries, there is a decrease in the misrepresentation of financial statements this is attributable to the need for firms to attract investment during this critical time. I discuss these and other studies further in the literature review however what is acknowledged from these papers is that the increased regulatory environment during the financial crisis period compounded by the need to attract quality investment leads to a decline in AEM. This research accepts that there would be increased regulation and monitoring during this time but then provides a different angle or view of EM during this period by analyzing whether the declining liquidity from institutions such as banks and the need to attract investment or avoid further restriction on existing debt covenants provides an incentive for firms to segue from AEM to REM or maybe even increase the use of AEM in certain firms thus providing further knowledge and understanding about EM during the financial crisis.

This research is distinctive and distinguishes itself in that it investigates EM during the financial crisis in the UK from the perspective of declining liquidity on both the supply and demand side while including an additional methodology of REM and going further to examine the nature and characteristics of the firms that engage in these EM methods. I also incorporate the extra dimension of least squares regression in two steps in the form of time trends by separating the negative and positive residuals for both AEM and REM and investigating these further separately in the two-stage least squares process. One reason for the use of two steps of the least squares regression is that it eschews the feedback loops that may exist in the model. Furthermore, a two-step least

squares comparison method also helps to avoid endogeneity biases. A reason for the use of the time trend analysis is that it enables us to compare the data from one time period to that of another time such as the financial crisis period to normal times. These are replicated as used by Cohen et al (2008)[5].This research makes further empirical progress on what has previously been studied regarding EM during the financial crisis. I provide the requisite answers and contributions on several fronts. Firstly by investigating whether UK-listed firms engaged in AEM and REM during the financial crisis and the movement between the two forms of EM. Secondly is whether the incentive of the declining liquidity is convincing enough for firms such as those with elevated debt levels to manage their earnings to avoid restrictions on their debt. The study also provides further evidence of whether firm characteristics such as operating flexibility or risk of bankruptcy affect a firm's ability to use either AEM or REM respectively. I observe both sides of the equation that is the supply side of funds by acknowledging that admittedly there were government interventions during this time to inject liquidity into the financial institutions, however as discussed previously there still was decreased lending by banks which was compounded further by a fall in the trade of commercial papers. I provide previous empirical results to support this.

I also examine the demand side by investigating how firms respond to this, one way is by EM to improve results thus avoiding restrictions on their debt and for other organizations to obtain financing for new projects. The second contribution is an empirical approach by probing whether firms that have restrictions in using AEM segue to REM. Previous studies on EM during the financial crisis have predominantly investigated this based on AEM. I seek to provide an additional argument by also examining REM. In some countries the results show a decline in AEM during the financial crisis, I investigate whether this may be due to a substitution of REM for AEM[6] hence managers may still achieve their overall objective despite using a different approach. Badertscher, (2011) observes that there is a pecking order in the use of EM in that firms will first use AEM and then segue to REM when the constraints or limitations of using AEM become too prohibitive.

The research is therefore premised on two specific questions is what the nature of EM used during this time is and whether there is a noticeable difference in the movement of AEM and REM by firms?. My hypothesis which I will expound on further in the methodology chapter is that the decline in liquidity provides a significant motivation and incentive for managers to use EM, thus when the benefits outweigh the costs firms will use EM to achieve their objectives. Furthermore when one EM method is restricted such as AEM by auditors or regulators then they will substitute this for REM despite the long-term negative consequences. The declining liquidity provides the incentive for firms to engage in EM. From previous studies the evidence is that there is a decline in AEM during the financial crisis period, I seek to find out whether there is a decrease. It could

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[5] Cohen et al (2008) investigate both AEM and REM pre and post the Sarbanes Oxley Act by firstly separating the positive and negative residuals for both models then running a second step regression as a time trend analysis. This paper follows these approaches.

[6] Part of the methodology and analysis for this study is to regress the AEM residuals against the three REM residuals that is abnormal production costs, abnormal discretionary expenses and abnormal cash flows to examine whether there is a substitution effect between AEM and REM

be that the declining liquidity is just too strong for certain firms with distinct characteristics to shy away from using AEM or if there is actually a decrease, is this decline countered by an increase in REM?

The other question is the size of the firms that engaged in EM during the financial crisis, I seek to find out if these would for example be small, medium, or large firms. I hypothesize that firms of different sizes would have varying compelling reasons to use EM. For example, medium-sized firms that are in the growth phase would have investors anticipating them to develop to the next level. These firms would thus be keen to show that they are strong and able to weather the storm of the financial crisis. On the other hand, large firms would have greater institutional investors capable of establishing if the firms have used EM and punish these actions for example by use of claw backs however they would still be keen to show strong financial results during the financial crisis period to attract investments. Small firms drew down heavily on their credit lines in the initial stages of the financial crisis as they feared a restriction on their credit lines. An argument would be that they would seek to improve financial performance to maintain or expand these lines of credit. The question will be to find out if the firm's characteristics determine the nature of the use of EM. For example, I anticipate that firms with longer operating cycles will have greater freedom to use AEM while those with greater risk of bankruptcy or tax rates will have fewer options to use REM. I also seek to answer the question if firm' characteristics such as financial constraints such as elevated debt or waning working capital levels have an impact on EM and the method that would be considered appropriate for managers of these firms.

The answers to these questions are of interest to several parties such as government regulatory agencies, investors, and accounting professional bodies. For example, by providing evidence of whether there is still the use of EM during the financial crisis periods, accounting regulators can offer guidance or standards to mitigate this. Additionally, investors are provided a fuller picture of EM during this time and not only that of AEM. Furthermore, the answer to the two questions provides a deeper view of EM on the notion of banks and commercial papers being safe institutions and instruments in a significantly declining liquidity environment. This is the case during the financial crisis which brings up the question of EM at this time as funds become much more limited and firms are faced with difficulty in accessing credit thus needing to show greater stability or financial strength. At the same time, banks and financial institutions that examine a company's financial statements need to decide on whether to engender their financial statements analysis methodology by not only analyzing AEM but also viewing this from the REM perspective to determine the firm's ability to draw down on their credit lines and service debts.

1.7 EARNINGS MANAGEMENT EVALUATED OMISSIONS

Despite the advancement of EM and the wide-ranging papers that have documented this practice, several criticisms have been leveled against previous studies on EM. Different papers do provide us with an improved understanding of EM while also bridging the gaps that have been evidenced in previous papers, however, certain reproaches persist. The two arguably central criticisms are that the studies are conducted in periods of normal economic conditions, and therefore do not take into account the macro economic environment and secondly is that other studies do not include

REM. Lin et al (2013) state that '' most previous research on earnings management was conducted during normal economic conditions and under the assumption of "business as usual". However, during a period when the macroeconomic environment is greatly unstable and significantly negatively impacted such as during an economic downturn, financial crisis, or the recent COVID pandemic, these times provide an unprecedented operating environment. The assumption of business as usual does not hold. This is also supported by Filip and Raffournier (2014) who remark that '' A common characteristic of these studies is that they do not take into consideration the macroeconomic environment of the firm''.

During a financial crisis, the general economic environment is very much unlike normal times. This period is characterized by a recognizable decline of the financial and stock market, currencies fall with some being devalued by their central banks. There is a significant loss in asset values and wealth. There are bank panics in some countries as evidenced by the run on some banks in the UK during the 2007/2008 financial crisis. This cocktail of events all at the same time provides a fundamentally subdued and depressed economic environment. I discuss the financial crisis setting in the subsequent section and how the 2007/2008 compares to the previous crisis. The agreement is that the financial crisis period is an outlier by itself thus the previous empirical findings of EM studies during normal times may not necessarily hold. The second criticism is that most studies only focus on AEM and do not consider REM activities, the argument is that by only studying one and not the other or vice versa the paper is not able to provide a holistic argument. One of the themes that emerges around EM is that when the incentives and motivations are compelling then managers will use EM to achieve their objectives such as to sustain or increase their compensation. Therefore by studying only one form of EM which is AEM which may show a decline in EM, we may conclude that managers may have improved the financial reporting quality whereas this may not be the case. They may just have substituted one form of EM method for the other. We therefore need to investigate both AEM and REM together so that we can conclusively rule out the use of EM as a whole.

Irani and Oesch, (2016) contend that ''by focusing on one earnings management technique in isolation (e.g., accrual-based methods), it is not possible to provide a complete picture''. This view is also supported by Cohen and Zarowin (2010). Other studies such as Badertscher (2011) have shown that there is a pecking order in the use of EM whereby firms will firstly use AEM then when this is constrained they will segue to REM. Thus managers will one way or another arrive at their overall objective of augmenting financial performance. As Cohen and Zarowin (2010) note, by only using AEM we do not study the effect of cash flow because accrual-based manipulation ''have no direct consequences on cash flow''. Most previous studies have shown a decline in AEM during the financial crisis periods, they find regulation and monitoring increases thus firms may be content with improved quality of accounting information. This could be plausible for example if a firm's debt covenants are tightly drafted with these requirements. However, the financial crisis period experienced significantly declining liquidity which in my view may also provide the appealing incentive that managers of firms have to engage in EM. In these instances the benefit of EM would still be strongly appealing, more so if it (AEM) is allowed by the accounting standards, and therefore the auditors and regulators would be agreeable (Defond and Subramanyam, 1998). However, if it was within the management's remit thus REM would be acceptable. Thus an

investigation of both AEM and REM during the financial crisis in respect to the declining liquidity is necessary and would deliver a fuller picture of EM at this particular time.

1.8 THESIS STRUCTURE

This study is structured to provide a seamless flow and transition between the various topics. The research involves a study of EM during the financial crisis from a declining liquidity point of view. The format therefore involves a fusion of the discussion and review of EM methods that is AEM and REM with the financial crisis dynamics of the decline in liquidity and the firm's constraint in obtaining funds. The thesis discusses the financial crisis and ventures deeper into the genesis of the crisis from the housing market and into the financial system and how the 2007/2008 differed from the previous crisis. This is then linked to EM and how firms have previously approached the issue of EM during this time. The literature review section discusses on the two EM methods and how managers use them in various circumstances. I discuss on the cost and benefits of using the AEM and REM and how managers substitute each of the methods at various times and also depending on their operating environment be it from the quality of auditors or the nature of the reversal of the accruals. I review studies done in other papers on these methods given the varying motivations and what the findings inform us regarding the use of these methods.

I thereafter review the financial crisis and the respective literature. This is then enjoined to the EM methods and what has been observed in previous studies that have investigated EM during the financial crisis. I firstly discuss on the criticisms that have been leveled against EM studies in general and further review the limitations of studies done on EM during the financial crisis. Thereafter I provide the contribution of this study and why the hypothesis is different from previous papers and what contribution the analysis intends to deliver. I then offer details on the methodology which includes the selection of the sample and the justification of the same. I outline the formulas for AEM and REM that will be applied and why these chosen formulas provide a confident approach to measuring the increase and decrease of EM during the different periods. The sign of the residual of the formulas that is whether it is positive or negative and if it is increasing or decreasing enables us to establish the movement of EM. I outline the regression process that will be used in this study that is firstly the empirical yearly analysis followed by the time series regression and two-stage least squares as well as the correlation between the positive and negative AEM and REM residuals plus the variables.

The thesis structure includes the methodology section that discusses on the various variables that may affect the outcome. I dissect further AEM and REM and which specific variables could impact the results. For example I discuss on the variables such as operating cycle that could either enable managers to augment AEM or which could be a hindrance. Another AEM variable is the net operating assets. Risk of bankruptcy or tax rates are examples of two variables of interest in investigating REM. We therefore also need to take these variables into consideration when interpreting the results. I also include other general and accounting ratio variables that have been found in previous studies to be of interest when investigating EM. The paper also discusses on the results firstly the descriptive statistics that outline the general structure of the data and thereafter the inferential statistics that is obtained from the two steps of the least squares regressions. I also

discuss the implications of the results for various stakeholders and what the limitations of this study vis-à-vis what other studies that can be derived from this thesis.

The paper has five chapters, the first one as already discussed is the introduction which I have provided the research background, motivation, and questions. This is then followed by the second chapter which examines the literature review. This chapter includes the theoretical framing for both AEM and REM whilst providing the financial crisis setting which presents the incentive for managers to utilize EM and finally the contribution for this research to the existing body of knowledge. The third chapter is the methodology which now develops the hypothesis and deliberates on the sample, data, EM proxies, and statistical tools that will be involved in analyzing the outlined research questions. The fourth chapter discusses the empirical results, the increase or decrease in EM, and at the same time whether this enables firms to improve performance. The final chapter is on the impact of these results and their implications. The chapter provides an overview of the research motivations and questions as discussed in the introduction and then links this to the results and whether the study has achieved its' ultimate objective thus providing the necessary contribution. It also provides an outline of what this contribution portends for the various stakeholders that is accounting regulators, government agencies or academics. It finally delves into the limitations encountered in the paper and what other further areas of research could be engendered from this study.

CHAPTER 2:**LITERATURE REVIEW**

The literature review provides an understanding of both the financial crisis and EM as presented in previous papers and then goes further to offer a contribution to this paper. I discuss EM which is the fundamental reasoning for the practice and the motivations and incentives that enable it to become a viable option for management plus what methods are related to its use and the costs and benefits that are taken into account by managers when deciding on which of the methods between AEM and REM method to use. In the initial stages, studies did investigate AEM and how certain incentives such as the need to increase compensation motivated for managers to engage in EM however as time went by researchers have also acknowledged that manipulation of discretionary accruals is not the only way to engage in EM but firms can deviate from their normal operations. This can be done by for example a reduction in spending on capital items or marketing to reduce costs and increase profit. Therefore REM method is thus another option for management. The EM methods have different theoretical framing and formulas. The literature review deliberates on these two approaches, their fundamental theoretical underpinning how they have been applied practically by organizations and what are the reasons for choosing one method as opposed to the other.

The literature also delves into not only the 2007/2008 financial crisis but also discusses on the previous financial crisis and how the blueprint established by the previous crisis through the housing market was also at play in the 2007/2008 economic downturn. I discuss the financial crisis in general as investigated in previous papers then show similarities with the 2007/2008 crisis in terms of the people obtaining mortgages and financing that they were unable to service and how this negatively impacted on not only the financial markets but the general economy as a whole with significant devastating impact. Finally, I show the distinction between the 2007/2008 financial crises and how this time the banking industry was much more involved and why the decline in liquidity was much more severe as compared to the previous crisis. I discuss on the different reasons for this and how firm especially medium-sized and small companies faced a funding gap. I thereafter fuse EM and the financial crisis by discussing on the investigation of EM during the financial crisis, I review previous studies and their results and how these outcomes are interpreted in terms of their relevance in enabling us to understand EM during the financial crisis and the various motivations. I subsequently offer insights into the limitations of previous papers and how this study extends the research and bridges the gaps while providing additional knowledge on EM during the financial crisis.

2.1 THEORETICAL FRAMEWORK

To begin with, it is imperative to layout the broad theoretical framework for this paper. The theoretical framework provides the construction or building that can support or hold up the framework. It is therefore important to provide this background to strengthen the arguments that will be delivered in the next segments as well as the rationale that over-arches this thesis. Lederman and Lederman (2015) state that the theory should seek to answer two questions that is ‘’what is the problem or question’’ and secondly ‘’why is your approach to solving the problem or answering the problem feasible’’. I firs outline the types of theoretical frameworks, these are

psychological theories, social theories, organizational theories, and economic theories. I will thereafter discuss which theoretical framework enables us to answer the two set questions by Lederman and Lederman (2015) Psychological theories are clustered into biological, psychodynamic, behavioral, cognitive, and humanistic. They are geared towards research in understanding (private) experiences (Mandler, 1980). These are mainly ideas that are involved with human behavior. Social theories are grouped into symbolic interactionism, social conflict, feminist, and structural-functional theories. These revolved around humans interacting with the wider society. Ekelund and Herbet (2013) state that economics can be viewed as a social science as it is how humans interact with each other in the market. Organizational theories are grouped as classical organizational, modern systems, contingency and decisions, and human relations also known as neo-classical theories. These are discourses that are interested in the structure of organizations and how actors in an organization relate to each other as well as the organization's structures and processes (Perrow, 2000). Economic theories are classified as supply-side economics, new classical economics, monetarism economics, and finally Keynesian economics. These economic theories are interested in the investigation of how economics work for organizations and countries (Niehans, 1989). These theories can be observed further to be involved in the understanding of financial markets, firms and governments. They aid economists in evaluating and understanding these institutions. These theories are therefore aligned with this paper and the research problems and questions that this thesis seeks to probe into.

Organizational theory is an approach that enables us to understand an organization and how it can meet its goals. It examines the operations and social structures of companies. Organizational theory involves the study of the dynamics of firm's vis-à-vis their performance and productivity. Interested stakeholders of this theory such as academics or business analysts would examine the social relationships between staff and their managers as well as study the company's structures to understand the efficiency and productivity in the work place Jones (2013). The theories under the organizational theory such as classical theory, neo-classical theory or modern theory are developed by the researchers as a way through which supervisors or managers relate with their staff or assign leadership responsibilities. The hypothesis and form of data collection then follow from this theory. It envelopes the variables and relationships that link the constructs together through which the organizational theory is analyzed (Bacharach, 1989). Even though this thesis examines firms listed on the London stock exchange it is important to point out that the research does not examine the structures of independent or sampled firms. I do not investigate the structures between management and staff or the form of leadership or morale of employees. The deep decline in financial crisis provides firms with the need to either obtain new lending or retain their debt covenants at the current or improved situations. This does not necessarily change the internal structures such as leadership management styles or relationships between staff or managers and if it does change this is not of research interest for this paper and does not lend us sound answers to the questions of interest. This thesis does not examine the cultural values, staff motivation, and span of control or division of labor of the firms. This research focuses on the firms from an angle or view that enables us to answer the set-out questions. The hypothesis, data collection, and formulas that follow the line of reasoning of agency or economic theory are better suited to provide the answers. These two theories are in a good position to answer the set-out questions. The symbol

of a good theoretical framework is that it gives a good answer to the questions (Lederman and Lederman, 2015). This is why I select them over and above the other frameworks.

New classical economics is based on the view that countries should liberate markets as well as encourage entrepreneurship and privatization of state-owned organizations. The reasoning for this is that markets are allowed to be sufficient and allow enough options for the populace. The government is there to make the markets work. Monetarism economic theory is founded on the view that the money supply is the central theme. The velocity which is defined as the pace by which money is interacting between the people is a fundamental methodology of this theory. The government will therefore regulate the movement of money to stimulate employment, interest rates, and GDP (Niehans, 1989). Finally, Keynesian economics is related to the inflexibility of price in that oscillations in expenditure will result in the change of output. The importance and significance of aggregate demand through governments, households, or businesses are the building blocks of Keynesian economics (Jahan et al, 2014). This paper has a component with the four economic theories in one or another way form. This is more so given the financial crisis period. The supply side of economics is interested in the law of supply and vice versa for the demand side. The law of demand and law of supply side are the basis of this theory For example evidenced by the demand for the limited available funds during this time.

Even though these four theories encapsulate the economic theory and are all related in some form to this research, it is also important to discuss agency theory which is also viewed as an economic relationship in the set of contracts between individuals within an economic business dealing. This is for example between employers and employees or shareholders and management. The principal authorizes the agent to act on their behalf. The agents such as the managers may operate in a self-interested way in that it does not fully represent the principal (Jensen and Meckling, 1976). For example, in using EM either through AEM or REM the management may prop up the financial statement results to receive augmented bonuses (Watts and Zimmerman, 1986). There may be conflict of interest that hinders the agents from operating fully in the best interest of the principal. In a financial crisis, the management may use either AEM or REM to show to shareholders that they performed better than their competitors or not as inferior as it could be. This paper is buttressed by agency theory as well as other economic theories by which this thesis is then constructed and built.

These two are more suited to this thesis. For example, psychological theories is interested in human behavior and how they relate to each other or function (Mandler, 1980). The research in this area may even be observed in a controlled environment such as a laboratory. This interest in human behavior and change or adaptation does not correspond to this thesis and this form of financial reporting research. These theories are also not associated or affiliated to this thesis which seeks to examine financial statements data and examine this during the financial crisis. These two theories are best suited to answer the two questions by Lederman and Lederman (2015). The first question is ‘’what is the problem or question’’. This is on the use of EM during the financial crisis period which is best answered by the agency and economic theoretical framework. The second question is ‘’why is your approach to solving the problem or answering the problem feasible’’. This is also answered by the use of agency and economic theory through the existing literature on these two

and how they enable this thesis to construct the hypothesis, obtain data, and the formulas, analyze the data, and interpret the result. I discuss these two (agency and economic) theories in depth below and how they provide the foundation for this thesis and the literature that surrounds these two theories.

2.1(A) AGENCY THEORY

This thesis is based on agency and economic theory. In this segment, I discuss agency theory and its relevance to this thesis and how this theory is centrally positioned in this thesis. Firstly I discuss agency theory in general then I correlate this to the use of EM and its motivation during the financial crisis period. In a simple form, agency theory is when one party who in this case is called the agent acts on behalf of someone else who is called the principal. Agency theory is embedded in history as early as the period of joint stock companies. Since then the issue of agency theory has taken various forms and costs depending on the issue at hand. Even though the theory has been around for a long time, the development and research in this area has led to incremental advancement with papers providing additional views on this theory. The seminal pioneer by Berle and Means (1932) in the book *The Modern Corporation and Private Property* discusses the separation of ownership and the dispersed form of control. In a joint stock corporation, the shareholders (principal) will delegate to the managers (agent) the authority to run their business. Ross (1973) follows this and observes that agency theory is an agency problem of incentives. The fundamental problem is one of compensation decisions. Principals delegate the business work to the agents who will make decisions in the best interest of the principal and are compensated for this work. Jensen and Meckling (1976) find that the firm is ‘’a set of contracts of production’’. The agency relationship is a contract between the principal and the agent. The principal will incur agency costs to monitor the agent. The principal will also incur costs to incentivize the agent to perform their activities in the best interest of the principal. Mitchell and Meacheam (2011) state that ‘’Agency theory is based on the relationship between one party, the principal, who designates certain tasks and decisions to another party, the principal who designates certain tasks to another party, the agent. The focus of agency theory stems from assumptions that the agency will behave opportunistically, particularly if their interest conflict with the principal’’.

There has been significant theory development on this. Agency theory is a central theme in corporate governance, and management. Pfeffer (1993) and Bendickson et al (2016) both note that agency theory is one of the leading theories on management, corporate governance and strategy. The agency theory has been discussed in various fields not only predominantly in economics and finance however also in other academic fields such as marketing ((Bergen, Dutta, & Walker, 1992; Logan, 2000; Tate et al., 2010), sociology (Adams et al 1996; Kiser & Tong, 1992) and political science (Hammond & Knott, 1996; Weingast & Moran, 1983). These examples of academic fields and papers show the extent of the spread of agency theory and its importance in academia. This theory is also used in this thesis. The agency theory is a central theme and foundation for this thesis. It guides the other aspects such as the literature review, methodology such as data collection and formulas as well the interpretation of the results, and finally the contribution not only for accounting in general but for the agency relationship as well. The financial statement is a form

through which principals monitor agents. The set of accounts is through which the agent will report to the principal the performance of the business. Watts and Zimmerman (1986) state that "if accounting is an important part of the firm's contracting process and agency costs vary with different contracts, accounting procedures''. The rationale is therefore that firms will use accounting discretion to their benefit. The accounting method to be used will depend on the incentives and motivation at play. The agents will use EM as a means to appease the principals and thus maintain a positive agency relationship

Prior literature shows that managers as agents have incentives to improve financial statement performance to maintain their positions or avoid punishment by principals. Healy (1985) finds that managers use earnings manipulation depending on the level of bonuses. Teoh, Welch, and Wong (1988) also note that in an initial public offering then issuers manage earnings to obtain a higher selling price from investors. DeAngelo (1986) observes that management as agents may show positive financial statements to voting stockholders. Thus there is undoubtedly a use of earnings by firms for various purposes so as for agents to improve their positions. I discuss this in greater depth in the following segments of this section. The principals therefore institute measures to deter this action. The shareholders as principals need financial information for decision making. They will incur monitoring costs to study that financial statements prepared by agents provide a true and fair view of performance. One of these is through auditors. Watts and Zimmerman [1986] observe that an auditor's reputation is important in ensuring a strong quality of financial reporting. They find that the principal-agent setting even in the merchant guilds in early times was strengthened by auditors' reputation which served as a connection or link for independence. The shareholders such as institutional investors can also employ qualified personnel to detect these actions. This thesis therefore hypothesizes that during the financial crisis when there is a deep declining liquidity and there are limited funds available (Ivashina and Scharfstein, 2010) and Borio et al, 2010) then firms will manage their earnings to show that they are still financially strong thus able to maintain their debt covenants at the same level or able to obtain new funding such as loans. They will use either AEM or REM depending on the strength of monitoring instituted by the firm to detect either form of EM The need for the firms to maintain their principal and agent relationship is too strong at this time. The shareholders, managers, and debt-holders are all relevant and interested in the financial statements. Jensen and Meckling (1976) is founded on the conflict between the managers and shareholders and the debt-holders. I therefore hypothesize that EM is of interest to each of these stakeholders at this financial crisis time.

2.1 (B) ECONOMIC THEORY

This thesis is not only founded on agency theory, it is also based on economic theory. I discuss this in this segment. It is important to point out from the beginning that economic theory is diverse. Ekelund and Herbert (2013) in their study on the history of economic theory and method state that ''economics is a heterogeneous discipline with numerous traditions, each based on a cluster of theories. Each theory uses observations, ideas and assumptions about how the world works''. Stigler (1984) also supports this by discussing the spread of economic theory and that there is an abundant supply of economic theories. This therefore means for this thesis I will focus on the

economic theory that is relevant for this thesis. Ekelund and Herbet (2013) elucidate that economics can be defined as a social science in that it is a study that involves human behavior. Economics studies involve human behavior within the market environment. They define a market as ‘’an institution arrangement that fosters the trade or exchange’’. They go on to state that ‘’ modern economics, therefore, is primarily the study of how markets of both kinds work, in terms both of their internal logical mechanism and how external forces bring about behavioral adjustments’. This thesis examines the market for finances or liquidity and its flow and trade from investors and banks to firms and the behavior during the financial crisis. Stigler (1984) lists three elements to a decision-making in economics. These are firstly that there are several goals, secondly that these are scarce resources, and finally the scarce resources can serve two goals. Loans from the stock market or bank loans are not infinite. These are offered to successful firms that have to compete for scarce resources. These resources are used for various reasons such as for expansion or working capital constraints. Various variables determine the extent to which firms can access these funds.

Prior literature has used economy-wide variables to examine the loan supply shifts to commitment and access. These papers use a combination of commercial papers and bank loans for their data. These include Bernanke (1983), Bernanke and Blinder (1992), Kashyap and Stein (1994), and Morgan and Rutherford (1998). However other papers such as Oliner and Rudebusch (1996) have criticized this method in that it does not adequately take into account the need for control of loan demand. To try to correct this, other papers have been modeled using firm-level and bank-level data. These papers include Gertler and Gilchrist (1994), Carpenter et al (1994), and Kashyap and Stein (2000). Despite this, the ability to obtain specific firms that are dependent on the bank vis-à-vis specific customers is still a problem. Nevertheless, the criticism of the gaps in these studies still provides us with an understanding of the relationship between the demand and supply of loans and funding. Stiglitz and Weiss (1981) discuss the equilibrium rationing or credit rationing in that lenders will require an expected rate of return that is not monotonically augmenting with the interest rate. King (1986) states that‘’ equilibrium may arise if the return on a loan does not increase monotonically with the interest rate charged because of adverse selection and incentive effects. In the absence of effective monitoring of borrowers, an increase in the rate of interest may decrease the return on the loan portfolio by attracting a riskier pool of borrowers’’.

This thesis is based on these economic theories in that in the financial crisis period there will a greater demand for funding loans than supply. Furthermore, the screening effect of borrowers is reduced with the use of EM. As already discussed, Ivashina and Scharfstein (2010) and Gorton et al (2004) already find that there was a decline in the lending by banks during the financial crisis. Other papers also show that despite the government intervention this did not result in an increase in bank loans. Borio et al (2010) find that small firms had already drawn down their facilities immediately during the financial crisis period. Whereas there was a demand for funding, the supply declined (Hogan (2019) and Acharya and Mora (2015). This decline in funding is exacerbated during the financial crisis when adverse selection and mforal hazards increase. Mishkin (1992) notes that the financial crisis drives funds away from those opportunities that are productive to one which the output declines. This is because of the asymmetry of the information and the pattern of data which is a feature of this period. This decline in lending not only affected firms however it

also impacted banks that were reluctant to lend to other banks (Kwan, 2009 and Pritsker, 2013). Flannery et al (2013) note that this was due to banks' opacity and loss of confidence by investors in the banking system while for lending of banks to firms was due to impaired assets and other write-downs. This thesis is based on these fundamentals. Firstly the decline in liquidity during the financial crisis resulted in limited funds available for firms. Secondly, this provided incentives for firms to use EM to show that they were still strong and able to come out of the financial crisis quicker than their peers and that they were able to service their debts. Third and finally, firms will use AEM or REM to prop up their financial performance. The incentive for EM at this time is too strong so if AEM is restricted due to the increased screening of financial statements by investors and banks then they will segue to REM, the demand for funds at this time was high while supply was declining significantly.

2.2 EARNINGS MANAGEMENT FRAMEWORK

The consensus amongst various stakeholders such as accounting professionals, investors, and government agencies is that accounting information should enable users to make informed decisions. IAS 1 sets out the objectives of financial statements, it states that the general purpose of financial statements is ''to provide information about the financial position, financial performance and cash flows of an entity that is useful to a wide range of users in making decisions''. Watts and Zimmerman (1986) observe that EM occurs when there is discretionary behavior on the reported numbers which allows firms to improve or worsen their financial performance above or below what the actual reality is. Managers seeking ways to augment or condense performance resort to EM when the incentives are strong enough and the benefits outweigh the costs. EM compromises accounting quality and in essence the reliability of financial statements. Quality financial statements are described as being useful to decision-makers, capturing as closely as possible the actual performance of the organization and also being able to provide a picture of the future and the implications of the same going forward. Various papers provide reasons as to the importance of good quality accounting these include enabling users to make informed decisions or for predictability of a firm's performance for investment purposes.

Gul and Goodwin (2010) observe that quality reporting enables external or third-party stakeholders to monitor the firm and the agreed contracts, these include suppliers or creditors risk profiling the firm or examining the potential of the company to default on their obligations. Ahmed and Duellman (2007) find that quality financial reports are of interest to the board of directors who in their corporate governance role can correctly compute compensation packages for the managers that are commensurate with the firm's performance. This therefore eschews a situation where managers are over-compensated based on inflated performance numbers. Raman et al (2013) in investigating mergers and acquisitions also conclude that the market for mergers and acquisitions is enhanced by improved accounting quality. In their study they find that ''earnings quality and takeover premiums are negatively related in negotiated takeovers, suggesting that bidders obtain valuable private information through negotiations''. Therefore when target firms had poor accounting quality information then in this instance the bidders would prefer direct negotiations. Accounting quality serves various stakeholders, the characteristics of these qualities will include its understandability, relevance, reliability, and consistency. However accountants in the corporate

world and economic environment work under different organizational forms and systems whose governance and reporting constitution may influence or pressurize the form or choice of reporting methods. Ultimately the accounting quality will be compromised by a lack of independence or due to the incentives or motivations that would be too appealing for EM.

Ezzamel (1994) and Robson (1991)[7] in their critical accounting studies analysis note that there is a social image prescribed by accountants and accounting bodies in that accountants and the information they present is neutral and produced for the benefit of the general public good. The financial statements are also portrayed as being calculatedly rational. However they are skeptical of this image and in their critical accounting studies observe that not only do accounting bodies set the accounting standard, but the accountants are both the preparers of financial statements and they also review them as auditors. They therefore have a central role in ''adjudicating the level of corporate profits reported to shareholders''. This may generate a conflict in that they may lean towards accounting that benefits management or shareholders.

In general, they find that ''vested interest'' plays an important role in accounting policies such as whether to capitalize costs or expense them. Other studies such as Zeff (1978) and Hope and Gray (1982) discuss not only the question of, in whose interests accountants perform their duties but also probe into the aspect of accounting standard setting and the policy-making process, and the power that various parties wield and use to influence the outcome. Watts (2006) observes that the accounting process is also political, he notes that the ''financial statements are viewed as a product of both markets and political process and the interactions among individuals and groups in the processes''. In this respect, the accounting information is not viewed as being neutral however the preparers also have an interest in the information they present, and by so doing they may seek to safeguard their self-interest.

Watts (2006) also notes that in the preparation of financial statements, individuals seek to maximize their utility, he observes that they are also creative and innovative in their actions. We can therefore accept that the financial statements have an inherent element of political power and management bias which seeks to safeguard management self-interest thereby enabling them to maximize their utility. This preparation of financial statements away from a neutral perspective but from a management self-interest point of view gives rise to EM and the need to manage the reported numbers based on the various incentives for managers to achieve their respective objectives. These actions are also undertaken by consummate and experienced accountants thus it may not be possible to detect this unless also understood by someone well versed in accounting and EM. Several papers find that even investors are sometimes incapable of establishing whether a firm has used certain EM methods. Furthermore, methods such as REM which are more difficult

[7] *Critical theory such as Ezzamel (1994) is understanding the society and power structures within various subjects such as marketing or human resources. However, the papers by Ezzamel (1994) and Robson (1991), discusses the accounting critical studies in which the players are also the referees in the same financial veins hence it is difficult for neutrality and independence.*

to detect are within management's purview thus making it even much more difficult to detect the use of this method.

2.3 MOTIVATIONS FOR EARNINGS MANAGEMENT

There are various incentives and motivations for managers to engage in EM which vary depending on the firm, its environment, and structures. These include organizations managing earnings either to qualify for import relief or receive a higher allowance or exemption. Jones (1991) explains that import relief by the United States government is based on several factors, these include the profitability in the industry and several other policies specified in the trade acts such as quotas, tariffs, and federal adjustment assistance. He states that ''managers have greater incentive to make income-decreasing accounting choices if they believe that the regulators do not completely adjust for these choices''. In that regard, it does not imply that the federal agencies can be easily manipulated into believing these numbers rather they do not perceive the investigation of the understatement of these figures as being cost-effective. Organizations can therefore be able to get away with this EM method and claim import relief as the government will not expend significant resources in investigating the same while the losers who are the public or consumer groups will not take further action to protect society against this as the cost of information, searching and lobbying would exceed the personal gain. Regulators would also take this into account and therefore not adjust the reported numbers, ''consumers would not be able to form effective coalitions to oppose this practice because the potential benefit to each consumer is too small''.

Managers may seek to receive a higher bonus based on their prescribed terms. They seek to extract rent from the organizations above what may legally or contractually be due to them. EM provides a tool through which they can achieve this goal. Managers could use income-increasing accruals that would show a better performance hence providing them with grounds to claim additional compensation. Healy (1985) claims that managers' use accounting policies that are beneficial to them. For example, when their bonus plans are altered or modified they will also amend their accounting policies along this line, they find that '' accrual policies of managers are related to income-reported incentives of their bonus contracts''. It is also worth noting that other studies on executive compensation and EM have found conflicting results. For example, Hagerman and Zmijewski (1979) observe that there is no notable correlation between the accounting methods used by firms and the executive compensation scheme vis-à-vis investment for tax credit. The underlying difference between previous studies and Healy (1985) is that this paper provides empirical evidence on not only income-increasing accruals but also tests the income-decreasing accruals, the reason being that when targets are not met and managers cannot increase performance to claim the compensation they may decide to decrease the performance further also known as ''taking a bath'' with the intention that they will increase accruals in the prospective periods.

Healy (1985) paper includes two tests which are accruals tests and tests of accounting change in accounting procedure. The accruals in this case are computed from the difference between the reported earnings and cash flow from operations these are then tested with the different bonus plans. The results are consistent with a theory that finds that there is a relation between the change in accounting procedures and the alteration of bonus plans. Managers may also be pressured by an

incoming CEO to show improved performance, EM is one avenue amongst others through which they can achieve this objective. By doing this managers use income-decreasing accruals to depress the performance and blame the situation on the outgoing CEO which then provides a platform for improved results going forward thus showing that the incoming CEO has turned around the firms' fortunes. Several studies such as Weisbach (1988) and Coughlan and Schmidt (1985) find that there is a weakening earnings performance which is also related to a declining stock price in the period preceding a CEO turnover. This becomes more evident if there is a CEO dismissal. Some of the methods used to achieve this is either via income-decreasing accruals or by writing down unprofitable departments or undesirable operations this provides grounds for blaming the outgoing CEO. The turnaround is then explained to be a result of the actions of the outgoing CEO to shareholders in that he/she has instituted strategies that have boosted performance which had been on the decline in the previous CEO's final years at the helm of the company. Dechow and Sloan (1991) observe that there is a decline in research and development expenditure which tends to be attributed to the outgoing CEO

Previous papers find this to be a genuine incentive and motivation for managers to use EM to blame the outgoing CEO for declining performance and improve the image and performance of the incoming CEO. However Murphy and Zimmerman, (1993) find contrary empirical evidence on this, they claim that the decline in accounting metrics such as capital expenditure, accounting accruals, and research and development costs is due to poor performance rather than EM. They state that ''there is no evidence of managerial discretion in strongly performing firms where the CEO retires as part of the normal succession''. They point out that a fundamental difference in their empirical findings as compared to previous studies is that unlike other papers that are variable specific and focus on a ''single financial variable and offer explanation for the behavior of that financial variable surrounding the CEO''. Their study ''examines and documents the behavior of a variety of financial variables surrounding CEO turnover and considers the implication of simultaneous changes among the variables''. They use variables such as accounting accruals, capital expenditure, and research and development which they consider to be discretionary and under greater managerial influence, while others like sales or assets are considered to be less discretional.

Another reason for managers to engage in EM is to improve their equity offers. Firms looking to offer their shares to the public through an initial public offering will seek to improve performance to maximize the increased share price thus obtaining higher capital or financing than their actual performance would warrant. Teoh et al (1998) find that firms with increased levels of accruals in the year before the initial public offering experience a declined performance three years post their initial trading at the stock market. They observe that ''issuers can report unusually high earnings by adopting discretionary accounting accrual adjustment that raises reported earnings relative to cash flow''. The effect of this is that if the public or investors rely on the financial statements to make decisions on the purchase price of the initial public offering then they would secure the stock at inflated prices. Ritter (1991) also observes that investors are usually confident about the growth prospects of young firms they therefore tend to believe the financial statements when they portray a positive picture. The adverse effects of EM preceding the initial public offering would then be revealed in time as reports either private or in the media become evident that the firm's

performance is unable to meet these expectations, investors face an impaired stock price later on and loss in their investment. The magnitude of this loss depends on the extent of EM that the firms have undertaken. Teoh et al (1998) state that '' other things being equal, the greater the earnings management at the time of offering, the larger the ultimate price correction''.

Managers also engage in EM to better their stock compensations. Managers have the benefit of being privy to private information while at the same time, they stand to benefit when they exercise their rights to compensation at a time when the firm is doing well and the stock price is at an elevated level. They can therefore use EM to improve performance which in turn results in the appreciation of the firm's stock price which then allows them to exercise their options and obtain a greater compensation than would be contractually due. The negative impact of this is that the future performance will then decline thus the firm would have settled the compensation at a higher price than it was supposed to hence a loss to the company. This would essentially deviate from the efficient market hypothesis[8] in that the shares always trade at fair value with stocks reflecting full information. This would be argued by opponents of this hypothesis in that investors can beat the market with shares trading at values different from their fair values.

Bartov and Mohanram (2004) claim that firms experience abnormally high earnings in the pre-stock option exercise period, this then reverses thereafter and the company suffers declining results in the post-exercise period reflecting a correction of the inflated earnings in the pre-exercise period. They also observe that this EM method is of such a sophisticated level that even experienced financial analysts are unable to discern it. This could also be a counterargument to the efficient market hypothesis. In this regard, we can be able to correlate the abnormally high option exercise with the future declining stock market returns. They also state that their findings suggest ''that the private information used by top-level executives to time abnormally large exercises follows from earnings management to increase the cash payout exercises''.

Firms also engage in EM to maintain the over-valuation of the firm. A firm's over-valuation has certain benefits such as increasing the benefits that are obtained by managers for example increased bonuses or stock options. These incentives provide a strong motivation for managers to use EM to sustain the over-valuation of the firm. Badertscher, (2011) finds that firms that are over-valued use EM as a tool for maintaining this over-valuation. He observes that the firms that have been over-valued for a long time also use the EM method for a longer period. These firms will alternate between the use of AEM and REM. In the pecking order of EM, the firms will first use AEM then when this method becomes untenable due to various reasons such as the need to reverse accruals or because of the quality of auditors then they will segue to REM which is more difficult to detect and also within the manager's purview but has a greater adverse effect over the long term. When they are unable to use both of these methods they will turn to a more egregious form of EM which

[8] *The Efficient market hypothesis is also a valid argument that information is reflected in all the shares in the stock market. There is therefore no space for someone to make a greater profits than others. However, for EM there is information asymmetry between managers who are internal and external stakeholders such as shareholders and the public.*

is outside GAAP and thus not in line with the accounting standards. They state that in general their results ''suggest that the duration of the firm overvaluation is an important determinant of management choices of alternative earnings management mechanisms''. This study will follow this line of reasoning by forming a hypothesis that firms facing significant liquidity pressures during the financial crisis will use EM to show that they can survive this period. The anticipation is that they will first use AEM then if this is restricted they will result to REM. Either way the incentive or motivations to use EM will be too strong for certain firms that they will segue between either of these methods.

EM can also be used by firms to meet or beat analysts' forecasts. Previous studies such as Kasznik and McNichols (2002) demonstrate that a ''company will have a valuation premium if it beats analyst forecast but will suffer stock price drop if its EPS falls short of analyst forecast''. The analyst forecast and conclusions will significantly impact on firms, failure to meet or beat these expectations by even a small margin can harm company's investment or share price. The extent of the use of analysts' forecasts is compounded by the findings in studies that show analysts preferring this as a benchmark. Managers are aware of this and the importance of meeting or beating analysts' forecasts, therefore EM is used as a tool that enables them to achieve this objective. Bhojraj et al. (2009) claim that firms can use low-quality earnings to just beat the analysts' forecast, these firms will thereafter exhibit an improvement in their stock price but this will be temporary. This will reverse, they observe the impact will be within a three-year horizon. One way to improve performance is through the reduction or postponement of discretionary expenses. They find that firms that have a reduction in discretionary expenditure also experience greater insider selling and equity issuance, which they note is due to the short–term view taken by managers who need to beat the analyst's benchmarks. Managers thereafter sell their stock in the company as they have insider information on the augmented performance and thus are keen to avoid losses in the future once the performance reverses. They state that their ''results confirm survey evidence suggesting managers engage in myopic behavior to beat benchmarks''.

Another motivation for managers to use EM is to improve the firm's earnings per share. Earnings per share measure which is computed by dividing the company's profit by the outstanding common shares is used by investors to determine the amount that a firm can distribute to its shareholders. Investors can then compare this with other firms to decide on which one provides a better return. This could be through dividend payout or via capital gains by share price appreciation. IAS 33 makes it mandatory for publicly traded firms to show on the face of the financial statements that is the comprehensive income statement both the basic and diluted earnings per share. The diluted earnings per share is obtained by including the diluted potential ordinary shares for example options and convertible instruments. Burnett et al (2012) observe that firms will purchase stock to improve their earnings per share numbers by decreasing the denominator of this formula. They find that firms that have high-quality investors who would then be able to detect AEM and would not be agreeable to this method would seek to use the REM method such as stock repurchase which will improve the earnings per share numbers. This method of stock purchase harms the firms' cash flow, even though the company does beat analysts' forecasts it uses funds that would have had a much higher return if it had been invested in other projects or they may need to seek financing to achieve other financial objectives which would come at a cost.

The advantage of using REM methods such as stock repurchases or jettisoning expenditure on certain items such as capital items or research and development is that, unlike AEM, these are under the management's discretion and therefore still enable the firm to achieve their objectives of improving the performance. Ultimately managers with compelling incentives or motives will seek ways to augment performance one way or another even though this may have a detrimental effect in the long term. These incentives provide appealing reasons for managers and firms to manage earnings. The search for rent extraction by managers and firms rather than what they deserve creates a winner-and-loser scenario. The winners are the managers and the losers are the shareholders, investors, or even the citizens who receive less tax from the firms but provide allowances as in the case of import relief. Even though previous studies find the incentives and motivations for EM to be compelling enough. In certain instances, other studies find inconclusive evidence of manager's motivations and actions. For example, it would be anticipated that managers may be incentivized by the need to decrease market valuation to a much more desirable level to take advantage of this when management buyouts are imminent, however, this may not be the case.

DeAngelo, (1986) explains there is normally a conflict of interest in business valuation during potential buy-outs as the public who are shareholders seek the best value for their investment while managers who are the purchasers would be keen to understate reported income to gain from the discounted value. To alleviate this, firms seek an independent opinion on the market value mainly from investment bankers who will employ valuation techniques that determine the fair value of assets. This nevertheless has not averted the numerous litigation actions that have been advanced by the public who feel that the compensation received is inadequate. The accounting numbers could be deemed to be of an independent firm and to provide a way to protect the interest of the sellers and at the same time provide the buyers with a sound basis through which they can determine the price. The financial statements that have been certified by external auditors would ideally seem to be reliable and free from inside management influence during the privatization of the firm. This claim could be further supported by an independent investment banker's valuation. He finds that there is no empirical evidence to conclude that managers would understate the reported numbers in the period preceding management buyout to take advantage and thereby disenfranchise public stakeholders. Despite this evidence, the public still seems not to be satisfied with the financial statements as done by external auditors' review or investment bankers' appraisal. They therefore seek to address their discontent through the courts who then use valuation methods that are not market-based but of a fair value nature thus further supporting the valuation used during the buyouts.

Others such as Longstreth, (1983) are still skeptical and believe that managers may depress the firm's performance and stock price in the period preceding the sale to take advantage. One way to do this is to provide a buy-out premium or a price above the financial statements however this would still be below the market value or would not represent management's full information. In general, even though papers such as DeAngelo (1986) may show that managers would not use EM such as understating numbers during the business valuation stage, the over-arching theme in EM literature is that this form of accounting and reporting is ubiquitous, thus when the motivations are strong enough it would be expected for managers to use this as one tool to achieve their objective.

This paper supports this view and seeks to investigate the same during the financial crisis given the economic situation and incentives during this time.

2.4 EARNINGS MANAGEMENT METHODS

The outlined motivations and incentives provide appealing reasons for managers to use EM, they achieve this by various means which include the cookie jar reserve technique whereby the firm overestimates expenses in a certain period when results are extra-ordinarily positive to create a reserve that can be used in future when the performance is below par. In this case, the over-estimated expenses will be reversed when the performance is beneath budget or expectation to boost the results. Some of these expenses would include inventory write-downs, over-estimating pension expenses, or percentage of completion of contracts. Another method would be a company taking a ''big bath'', in this method a firm that is experiencing a depressed or declining performance decides to downgrade the performance further as the negative results are inevitable. Managers therefore charge a hefty loss in this period and create a reserve that can be used in the future when the firm is underperforming, the firm can then utilize these accounting changes to meet or beat the analysts' expectations or forecasts. The argument in favor of the ''big bath'' is that the results would be bad news for the market anyway so it would make sense to depress them further at this point and provide room for these expenses to be reversed in future when necessary. One way of doing this is by posting restructuring costs during this negative period which can be reversed in the future to avoid earnings surprises. The cookie jar and big bath methods are accounting entries techniques, however managers can also adjust their operational activities away from the normal process. This would include postponing certain activities in a period when performance is not going well, such activities include marketing or research and development. Another operational method is to extend customers credit limit or payment terms so as to augment sales in the current period.

Scott (2009)[9] encapsulates these methods into four, firstly as discussed is ''taking a bath'' which as stated is used by firms that are experiencing low performance in certain periods to reduce their profits or suffer greater losses so as to have wiggle room to reverse this in future periods when needed. Secondly is ''income minimization'' which is used in times when the firm's profits are exceptionally high. In these periods managers will reduce their earnings by a moderate amount so as to provide a reserve to be used in future, the decline is less severe than that of taking a bath. Thirdly, is the opposite which is ''income maximization''. In this method firms will seek to augment performance to a much more favorable position especially if this does provide a personal benefit such as increase compensation and bonuses. Finally, the fourth aspect of EM methods is through ''earnings smoothing'', this enables firms to provide more stable results over time. By income smoothing managers are able to avoid volatility and excessive fluctuation, this makes the

[9] *In financial crisis period ''taking a bath'' may not be possible for some firms as negative results would hinder the ability of the firm to obtain loans or restrict debt covenants, however other schemes such as smoothing profits or drawing from ''cookie jar'' hence to improve better results and weather this difficult time would be more plausible.*

financial statements much more predictable. In general these four EM methods provide a brief outline that summarize the ways through which managers can manipulate the financial numbers. To achieve these four methods firms can either use the accounting standards that is AEM or they could alter their operations that is REM which other studies also define as cash flow earnings management.

The EM technique of adjusting the accounting entries and using the leeway provided by the accounting standards that enable managers to use their judgement when computing the numbers in the financial statement is defined as AEM while that of deviating from normal operational processes is termed as REM. AEM method takes advantage of the flexibility provided in financial reporting regulation to prepare financial statement results in a manner that is favorable to management. On the other hand, REM uses the powers under the management's purview that enable them to make decisions on the operational processes of the firm such as when to undertake a marketing campaign or if to initiate a certain research and development activity. Unlike AEM which is subject to auditor's scrutiny, REM even though it may have long-term negative consequences is often appealing to managers because firstly it is much more difficult to detect. Secondly, it is under their mandate thus unless questioned by shareholders or investors it is legally acceptable. Even if questioned, the courts would still accept REM as it is within the management's purview. AEM is subject to claw-back in certain jurisdictions if it is established that managers may have obtained compensation based on financial results that were improved by it. This may be deemed to have been paid irregularly as the accounting was not in line with the standards or if the reporting was not of good quality. I discuss both of these methods in detail in the following segments as well as the cost and benefits that would be weighed between the firms and the positive and desirable outcomes.

2.5 ACCRUALS EARNINGS MANAGEMENT (AEM)

Accounting standards do accept that the measurement of items for financial reporting can be subjective. An example is International Accounting Standard number eleven (IAS 11) on construction contracts which provides for the requirement that contract costs and revenues are allocated to the accounting period in which the construction work was undertaken. This can be subjective, especially for long contracts with work stretching several years or even decades, the managers therefore have the discretion over the allocations. Another example is whether to expense or capitalize charges. IAS 16 prescribes the asset as '' costs incurred initially to acquire or construct an item of property, plant and equipment and costs incurred subsequently to add or to replace part of or service it''. In this case, a firm is provided with some degree of freedom to determine whether the costs incurred were actually to acquire or construct the asset. Managers may decide to capitalize certain costs and explain them as capital items that need to be depreciated thus improving the firm's profitability in the current period as the depreciation charges will be spread out over time.

Another form of leeway provided in IAS 16 is on the replacement of the parts of an asset. IAS 16 states that ''the carrying amount of an item of property, plant and equipment will include the cost of replacing the part of such an item when that cost is incurred if the recognition criteria (future

benefits and measurement reliability) are met''. Therefore even though IAS 16 does recognize that certain parts of the asset will require to be replaced, there may be an instance where an asset is purchased to replace an existing part but it may also be used on its own which provides some difficulty in ascertaining its actual use. In this case, the management may decide to capitalize the item if there is a need to lower costs and augment the profit or they may expense it directly in the income statement if they are in a position that they need to depress the results in the period it is purchased. Other methods may involve flexibility in the treatment of borrowing costs. IAS 23 states that '' Borrowing costs that are directly attributable to the acquisition, construction or production of a qualifying asset form part of the cost of that asset. Other borrowing costs are recognized as an expense. Borrowing costs can be interest or other costs that an entity incurs in connection with the borrowing of funds''. IAS 23 therefore provides room for management to decide whether the borrowing costs are directly or indirectly related to the asset and its set-up into the business.

Another AEM method is through the provision for bad debts, management has inside information as to whether the debtor is likely to settle their obligation and the period as well. They may either decrease the provision in the period when they need to augment performance or become more conservative in a time when they are keen to depress the numbers. Another way is through the write-off on inventory. Through the inventory write-off, a firm can expunge from its books inventory that is no longer of value. This can be done either through expensing it in the costs of goods sold or through a contra in the asset account. Managers can increase the write-off for inventory in a period when they need to depress the performance further or on the other hand, they may delay the write-offs if they feel that this will negatively impact the performance and charge this in the subsequent accounting period. The accounting standards do envisage that certain items in the financial statements will need management's judgement thus they guidance on how this should be done. These methods are not completely exhaustive but I outline them as examples to show that AEM involves exploiting the leeway and freedoms provided by the accounting standards for managers to achieve their various objectives.

Healy and Wahlen (1999) define AEM as managers using judgements and discretion to manipulate financial information. Dechow et al (1995) note that in investigating AEM most researchers focus on the discretionary components of the reported income. The models currently used by most papers are interested in this discretionary element as it is the method applicable in manipulating the financial statements thus this is of concern rather than the items that have minimal risk of being manipulated as they are less subjective. Thomas and Zang (2012) state that most papers form a hypothesis as to the motivation or incentives that managers would have to use. Once the argument has been established they then structure the methodology to investigate the type of discretionary accruals that would be used to achieve this objective. They observe that AEM is orchestrated in a systematic manner such that earnings are managed predictably as a response to the incentive or motivation. McNichols and Wilson (1988) also note that most papers use either a ''portfolio'' approach in that they sum the discretionary accruals when investigating earnings while others will involve a ''representative ''approach and use a single discretionary accrual such as provision of bad debts. However, they note that we should be cautious when investigating EM and take into consideration the economic circumstances such as marketing strategies or investment as they

influence the discretionary accruals. They claim that there is a risk of observing AEM even when this is not present but the financial statements may have been influenced by the changing economic conditions we therefore need to consider this in our analysis and approach.

AEM misinforms stakeholders that certain performance targets have been met or surpassed, managers utilize the flexibility provided by accounting standards to achieve these financial reporting objectives. They also exploit AEM to send signals and communicate the improved performance to interested parties, this information allows them to maximize their utility and generate greater benefits. AEM also casts doubts over the reliability and quality of the financial statements. The statement of financial concept number 1 states that '' High-quality earnings provide more information about the features of a firm's financial performance that are relevant to a specific decision made by a specific decision-maker''. By using the discretion provided by the accounting standards to manage the firm's performance. Managers are by implication not providing the correct picture as to the firm's performance thus decision makers may either not be able to decide on future investments or they may unfortunately make incorrect decisions. This is more so for investors or shareholders who may not have the sophisticated tools that would enable them to discern EM or for firms with poor corporate governance such that the auditors or board of directors may not have the muscle to curtail the accounting manipulation. However, for certain investors such as pension funds or hedge funds who invest in the stock market or venture capital that may purchase a stake in private firms, they will employ qualified professionals such as investment bankers who may have the ability to disentangle the financial statements and be alert in regards to the management of the firm's performance. They will use certain methods that allow them to measure how far the discretionary accruals are from the normal levels. Previous studies such as Brown and Caylor (2005) and Herrmann, Hope, Payne, and Thomas (2011)[10] find that investors and analysts generally anticipate this form of EM, the reason being that firms under pressure to meet or beat analysts' targets will find ways such as EM to achieve this objective.

Previous studies investigate these AEM methods in several ways and utilize different proxies. The most common method also known as the Jones (1991) model uses the measure of total accruals to determine the extent of EM in the firm. The total accruals involve the regression on change in sales and change in property plant and equipment. Healy (1985) and DeAngelo (1986) also use this method whilst introducing regression to control for non-discretionary accruals. A follow-up to the Jones (1991) model is the modified Jones model as elucidated in Dechow et al (1995) which regresses the change in sales on the change in property plant and equipment but also adjusts the revenues for change in receivable as at the end of the period. The reason for this is to exclude credit sales as management may have used this to increase revenues but the cash may not be forthcoming. In essence, the sales would be increased in profit and loss the same would not translate to improved

[10] Brown and Caylor (2005) introduce other metrics such as corporate governance provisions that the board examines how these are linked to return on assets and return on equity. Herrmann, Hope, Payne, and Thomas (2011) state that there is no special point for earnings management for zero or very small changes as it relates to investors. In essence, there are other motivations for managers to use EM rather than to meet or beat analyst's forecasts.

cash balances however the debtor's balances would have enlarged. Other studies use more specific accruals, they design their methods to also identify the discretionary and non-discretionary components of these specific accruals. Examples of these include Petroni (1992) which involves the use of claim loss reserve estimation error, which is measured as a five-year development of loss reserves of property and casualty insurers. Beneish (1997) applies certain indexes to measure AEM, these include the gross margin index, asset quality index, days in receivable index, total accruals to total asset index, and depreciation index.

Beaver and McNichols (1998) use the discretionary accrual proxy for the development of loss reserves of property casualty insurers, they do this for one year. Apart from total accruals and specific accruals. McNichols (2000) observes that other studies use the frequency of distribution approach. Examples include Burgstahler and Dichev (1997) who test whether the '' frequency of annual realizations in the region above (below) zero earnings and last year's earnings is greater (less) than expected''. Myers et al (2007) test whether the ''number of consecutive earnings increase is greater than expected absent earnings management''. Degeorge et al (1999) test whether ''the frequency of quarterly earnings realizations in the region above (below) zero earnings, last quarter's earnings and analysts' forecasts is greater (less) than expected''.McNichols (2000) in her study of three EM methods that is specific accruals, aggregate accruals, and those based on the distribution of earnings after management, finds through an empirical evaluation of EM literature and the methods used that Jones (1991) model which focuses on aggregate accruals is the most commonly used method by researchers when investigating AEM. She also finds that after controlling for the earnings performance of the companies the estimation results for the Jones model is slightly weaker than those for the modified Jones model. This would mean that when investigating firms that vary in growth characteristics and earnings performance, the researcher may observe differences in discretionary accruals which may be attributable to the ''performance characteristics of the firms rather than their earnings management''. I use both of these methods that is the Jones and modified Jones formula as will be discussed further in the methodology section.

She (McNichols, 2000) observes that a limitation of the AEM methods is that they rely on the discretion of the accruals, these models therefore have an inherent constrain in that they do not provide an approach to determine how accruals behave in the absence of discretion. In this respect when there is no or limited freedom in the use of accruals then there is a deficit in the application of the AEM methods. She goes on to claim that this limitation makes the task of controlling and identifying potentially correlated omitted variables quite daunting. She suggests that for future research a ''departure from extensive reliance on aggregate accruals approach'' would be appropriate and that ''future progress on earnings management literature is more likely to come from the application of specific accruals and distribution-based tests than from aggregate accruals''. Despite these misgivings, research papers post the McNichols (2000) study still use the Jones and modified Jones model as proxies for AEM. This is not only for studies that investigate AEM but also for comparing this to REM. Examples include Bhojraj et al (2009), Chan et al (2014), Cohen and Zarowin (2010), Zang (2012) and Badertscher (2011). These studies investigate the use of both AEM and REM when certain incentives and motivations are hypothesized to be at play. I therefore follow the same approach as these studies and use the Jones and Modified Jones

models to investigate AEM in the periods preceding, during, and after the financial crisis. Despite the limitations pointed out by McNichols (2000), these proxies still provide sound and robust results, furthermore, the reliance on these models by other papers that have gained acceptance amongst the professional and academic community thus provides some level of assurance on the reliability of these methods and their usefulness and value.

2.6 REAL EARNINGS MANAGEMENT (REM)

Another method through which managers can manage earnings is by the use of REM which involves a deviation from the normal operational processes of the firm, these are practices that may not be optimal or could even be detrimental to the firm. However, these processes enable managers to achieve their objectives and meet their sought-after financial reporting objectives. Roychowdhury (2006) defines REM as ''departures from normal operational practices desired to mislead stakeholders into believing certain financial reporting goals have been met in the normal course of operations''. REM activities include deviation from certain normal operations for example in altering shipment schedules. Fudenberg and Tirole (1995) observe that firms can modify their operations by altering the time when shipment is done especially if it is close to the end of the financial year to smoothen the underlying cash flows. In this case, they can either accelerate or slow down the shipment schedules depending on the overall objectives at that particular time. Another way through which normal operations can be altered is through stock repurchase. Repurchasing of stock to avoid dilution. By reducing stock dilution a firm diminishes its existing shareholding stake as a ratio of the issuing new equity of the whole firm. This is especially so when results are on a decline and the organization is at risk of not being able to meet its earnings target. The dilution therefore provides an avenue through which it can achieve its earnings per share benchmark by lowering the denominator used to calculate the earnings per share ratio.

Bens et al. (2003) investigate whether the effects of diluted securities are offset by executives augmenting the levels of the firm's repurchase through for example employee stock options that allow them to fend off the effects of diluted earnings per share. They also study if executives increase the levels of share repurchase when they become aware that the company will not be in a position to achieve its desired earnings per share. They find that managers would increase the level of stock repurchase when earnings fall below the level required to achieve the expected earnings per share growth. Secondly, stock repurchase is used by managers when the ''dilutive effects of outstanding employee stock options on diluted earnings per share increases''. In essence, they observe that managers' actions such as employee stock options are not purposefully driven by the need for an employee to exercise their options at that time but rather are a result of the motivation or incentive by the firm to achieve its diluted earnings per share target and not the basic earnings per share. This method of REM thus becomes a viable option at that time. As outlined earlier IAS 33 on earnings per share requires firms to disclose this on their comprehensive income statement hence it becomes quite an evident reporting metric that is easily observable by the various external stakeholders.

Another form of REM is increasing sales either through significant discounts or lenient credit terms. Firms may find that they may not be in a position to achieve their revenue targets which will by implication also affect their bottom line, they may result in discounting their sales to attract customers and increase their turnover. They may also introduce buy now pay later methods which will increase the turnover but have a negative impact on cash flow. Roychowdhury (2006) acknowledges that the departure from normal operations of the firm even though this may assist managers in meeting reporting goals, the actions are not of benefit to the firm's long-term value. He finds price discounts to be one method of engaging in REM. Managers can do this by introducing short-term price discounts especially near to the close of the financial year when there is a need to increase sales. These increased sales are thus likely to disappear in the subsequent financial period when the price discounts are removed. He further observes that '' the cash inflow per sale, net of discounts, from these additional sales is lower as margins decline. Total earnings in the current period are higher as the additional sales are booked, assuming positive margins. The lower margins due to the price discounts cause production costs relative to sales to be abnormally high''.

Another way that managers can augment revenue is by offering extended credit terms when they need to achieve certain turnover targets. Roychowdhury (2006) notes that certain industries such as retailers or automobile manufacturers can offer lower interest rates which can go to as low as zero percent when the close of the financial year is imminent. He states that ''these are price discounts and lead to lower cash inflow over the life of the sales, as long as suppliers to the firm do not offer matching discounts on firm inputs''. In general price discounts and lenient credit terms to increase revenue would lead to higher production costs than what is expected or is normal in tandem with the sales level whilst at the same impacting negatively on the current cash flow. Managers can also deviate from normal operations by delaying certain expenditures. These are costs that would not entirely adversely impact the day-to-day activities of the firm or if these costs do not generate immediate returns or revenue then there would be a motivation to postpone them to a later period if the firm needs to minimize its current expenses. These include research and development costs, marketing costs, or maintenance expenses. The firm can therefore lower their reported expenses by reducing the discretionary expenses.

Firms that use discretionary expenses as a way to lower costs would exhibit extraordinarily low discretionary expenses that deviate from the normal. Roychowdhury (2006) calculates the discretionary expenses as the sum of research and development, advertising, sales, general and administrative expenses. This paper uses this approach in the methodology when computing the discretionary expenses of the firms of interest. Unlike AEM which utilizes the flexibility of accounting standards, REM exploits the business operational decision-making powers that managers are afforded by the nature of their positions. These REM methods may be detrimental to the long-term value of the firm however the approach may be deemed to be of necessity when AEM has either reached its end or point of reversal or if the auditors would not allow the use of AEM. Graham et al (2005) in their survey find several reasons why REM is used by finance executives even though it has a negative impact on the firm, these include pressure to meet earnings targets even when the managers are aware that this has a detrimental effect on the firms' long term value. He observes that they could decide to offer customers discounts if they need to accelerate

sales thus lowering their profit margins or they could extend the credit terms of their clients thus improving sales but also affecting cash flow. The ultimate objective would be that earnings would be augmented in the short term thus improving performance from an operational profit or earnings per share point of view however over the long run these will have negative effects on other financial metrics such as receivable days or free cash flow. Cohen et al (2008) and Cohen and Zarowin (2010)[11] observe that REM has the possible potential to impose great negative consequences on the firm's value as it does affect future cash flow and long-term costs to shareholders.

Other techniques applied by managers who utilize REM is to increase inventory or overproduction, the aim is to lower the cost of goods sold. Overproduction can increase the holding costs of excess stock if the firm is unable to sell this in the subsequent period which would impact on value and the firm's cash flow over the long term. The assumption is that managers will use overproduction if the current increase in the holding costs will be offset by the reported reduction in production costs. These stocks could also become obsolete or could expire if they have a limited useful life. Thomas and Zhang (2002) also find evidence of overproduction as a means of EM that is used by managers however they caution that this may be affected by the general economic conditions thus the results are not entirely categorical. It is also noteworthy to state that overproduction is only available to manufacturing firms and thus is limited to only a certain type of industry. REM can be measured by investigating the deviation away from normal operational processes. Roychowdhury (2006) study provided various ways through which REM can be operationalized by managers, the models enable us to ''separate the normal from abnormal levels of real operations activities as reflected in the cash flows from operations, production costs, and discretionary expenditures''. The formulae examine REM in four ways also defined as operating income, these are the cost of goods sold, inventory, production, and discretionary expenses. Other studies undertaking REM such as Dechow et al (1998), Badertscher (2011), Cohen and Zarowin (2010) also apply these methods. Managers find REM appealing as it is less likely to be scrutinized by regulators or external auditors. Cohen et al (2008) note that as long as it is disclosed correctly in the financial reports then there will be less or no opposition from auditors in their opinion or regulators in their findings. I also use the Roychowdhury (2006) formulas in this paper to examine the use of REM amongst the firms of interest, I discuss this further in the methodology section.

2.7 APPLICATIONS OF AEM AND REM

Managers will lean towards either AEM or REM due to various reasons, as already discussed these two methods use either the leeway provided in the accounting standards or management. The different costs and benefits attributable to these EM methods are fundamental for managers when

[11]*As stated in such as Cohen et al (2008) and Cohen and Zarowin (2010) REM has a detrimental effect on cash flow and negates a firms' value, however when AEM is restricted then REM becomes plausible to meet targets despite the future negative outcomes. This paper also uses Cohen et al (2008) and theirs methodology techniques. Cohen et al (2008) accept the long-term financial harms of REM.*

deciding on which EM method to use. And if REM then the different methods be it abnormal production costs, abnormal cash flow, or abnormal discretionary expenses. These include benefits such as enhancing a manager's remuneration or concealing the actual performance. The costs entail a negative impact on the firm's value, litigation, and a decline in the stock price when the market finds out, and consequently a loss in reputation in the labor market. If the benefits of EM outweigh the costs then managers will decide on which EM method is suitable in enabling them to attain their objectives. Even though there is a similarity between AEM and REM which is more in terms of their objectives they are used differently to achieve distinct purposes. These two EM methods are ways through which managers can prop up financial reporting numbers to portray a better performance and therefore meet or surpass certain benchmarks and targets. However, they both arrive at this differently. The incentive for utilizing EM along with the costs and benefits of AEM versus REM will be the over-arching factors for managers to decide on which EM tool best serves their interests.

Previous studies find that certain actions such as audit fees impact on accounting quality. Corporate governance mechanisms can have an impact on the financial reporting of the firm. Palmrose et al (2004) claim that there is an association between financial statement restatement and the provision of unspecified non-audit services. They also establish that there is quite a strong association between the provision of tax services by auditors and the extent of restatement of financial statements. The introduction of the Sarbanes Oxley Act of 2002 was based on the premise that some fees paid to auditors impair their independence and has a negative impact on the quality of the financial statements. Therefore if the auditors are restricted to provision of audit services only as is the case in certain jurisdictions or if the provision of non-audit services is firmly regulated then this improves the firm's corporate governance. The corporate governance space and its flexibility do impact the type of EM method that managers will use. Cohen et al (2008) state that there was a steady increase in the use of AEM between the years 1987 to 2002, they observed a steady decline after 2002 that is in the period after the passing of the Sarbanes Oxley Act.

However, they also find that even though there was a decline in AEM, the post-Sarbanes Oxley period also experienced an increase in REM which would mean that when managers are restricted from manipulating financial statements due to the regulation of improved audit quality they will seek to use REM to achieve their objectives. Cohen et al (2008)[12] claim that in the period subsequent to the introduction of the Sarbanes Oxley Act, firms that met their benchmarks or exceeded their targets achieved this by using less accruals but applying more of REM methods. They provide evidence to show that there was an increasing use of AEM in the periods before the Sarbanes Oxley Act implementation. Their analysis also shows that in the period preceding the passage of the Sarbanes Oxley Act, there is a strong correlation between the increase in the fraction of equity-based compensation and the increase in accrual-based EM use. Thus from this, we can

[12]Cohen et al (2008) papers investigate AEM and REM pre and post-Sarbanes Oxley, this paper uses these methodologies pre and post-financial crisis between AEM and REM.

establish that the application of either AEM or REM is dependent to the audit quality environment and regulation that firms face.

Desai et al (2006) also investigated financial restatements and found that there is a correlation between the increasing restatements and manager turnover in the firm. They note that there are two factors that impact on the declining quality of financial reporting prior to the 1997 and 1998 periods. These are firstly lack of a strong corporate governance mechanism or internal structures that punish managers for weak or poor quality financial reports in line with Jensen (1993). The second reason is that in previous years the Securities and Exchange Commission in the United States had limited mechanisms that would enable it to monitor managers or take action, they also had limited resources that hindered their ability to investigate financial reporting violations. Thus in the years prior to 1997 and 1998, there was a feeling that managers were immune to the consequences of restated financial statements and declining quality of financial statements. However, even though this appears to be the case the management labor market does provide a recourse to punish managers and instill some sense of oversight over the quality of financial reports. The reputation of managers would therefore be at stake when they are replaced or are changed due to the financial restatement.

Desai et al (2006) find that there is a turnover in at least one manager in about sixty percent of the investigated firms that restated their financials within 24 months. They also observe that the displaced managers from the firms that restated their financials have poorer employment prospects. These results therefore do provide evidence that there are private penalties for managers of firms that have poor quality financial reports due to restatement of their performance. However, it is also important to note that other studies do not find such a relation for example Beneish (1999) does not find that the violation of GAAP or financial reporting fraud are related to increased management turnover. A significant difference between the Desai et al (2006) and Beneish (1999) is the sample size. Whereas Beneish (1999) uses 64 firms, Desai et al (2006) use 146 firms that had restated financials between 1997 and 1998. We can also accept from the Desai et al (2006) findings that managers who fear the consequences of the penalties meted out by the labor market would be keen to improve the quality of the financial statements they would adhere to GAAP reporting guidelines thus they would steer away from AEM and lean towards REM.

The allure for managers to utilize AEM methods is that they can be applied at or after the end of the financial year when managers feel the need to improve their reported numbers, unlike REM which needs time to manifest itself. Firms may find themselves in a position where they are unable to meet targets or benchmarks after the close of the financial year, these may be due to an unexpected activity or occurrence just close to the year-end be it from a macro-economic level such as a political event or internally, for example, a machine breakdown for a couple of days. They may also experience a slowdown in sales just close to the end of the financial period hence management may not have enough time to institute REM measures such as introducing discounts or extending sales terms to customers. They will therefore need to use an EM method post the close of the financial year which will enable them to achieve the desired results for last year. In such circumstances AEM will be the EM method of choice as it involves the manipulation of financial statements based on the discretion provided by the accounting standards an example

would be delaying accruals for certain expenses that occurred just close to the end of the financial year and posting them in the next financial period.

AEM may also be found to be within the agreed reporting standards and therefore as long as it does not contravene or breach the accounting standards then the auditors would be agreeable. Gunny (2005) states that ‘’Real earnings management is one potential consequence of regulations intended to restrict the discretion of accounting earnings management’’. This implies that when the accounting standards are restrictive and provide less wiggle room for managers to make decisions and the set out reporting guidelines that need to be followed are prohibitive then firms will resort to REM by default. This is due to the reason that as already mentioned and found empirically in previous studies. EM is pervasive therefore managers will try to find different methods to achieve the overall objectives either via AEM or REM. This is also observed by Ewert and Wagenhofer (2005) who claim that when accounting standards are strengthened or tightened hence reducing the room for discretion in accruals then REM increases, they also develop an analytical model that provides an empirical methodology for the same. By extension and in line with this research studying one form of EM may not provide the full picture. Fields et al (2001) also note that when analyzing EM researchers need to consider both methods as managers who are restricted by AEM will still need to achieve their objective hence they will use REM.

Zang (2012) finds that firms utilize AEM and not REM when they have a low market share or may be facing a risk of bankruptcy in which case they will not want to deviate from their levels of spending. Market leaders have several advantages such as greater economies of scale that enable them to have a better position to bargain with suppliers and customers. They also have more experience having been in the industry for a while. Additionally, they have the benefit of being in the position to influence market trends which are then followed by the competitors, they can also have a wider pool of investors. These benefits enable them to view REM as less costly as they have sufficient headroom to withstand the market pressures unlike firms with a small market share that may suffer adversely when they deviate from the normal course of business to other less optimal options. The firms with a poor market share will be in an even worse state when they are not performing well. The managers in these firms will be keen on improving their operational activities to capture more market share from their competitors. Graham et al (2005) also observe that CFOs whose firms are in a ‘’negative tailspin’’ or in a deteriorating state will seek to use most of their efforts to turn around this situation therefore REM will be less of an option as they implement measures to improve their operations. Their search and efforts to survive will dominate the management’s strategic and therefore operational motives, the need to improve actual performance will take precedence over the EM method. I therefore investigate AEM and REM to observe both EM methods.

The disadvantage of utilizing AEM is that it is subject to greater scrutiny, especially from high - quality auditors. For example, Burnett et al (2012) note that quality auditors constrain the manager’s ability to use this method. Their finding that high audit quality constraints manager’s ability to utilize AEM is consistent with other studies such as Krishan (2003) and Balsam et al (2003). However other papers on REM as a substitute for AEM in the presence of high-quality auditors provide mixed results. Whereas Cohen and Zarowin (2010) observe upward AEM. Zang

(2012) does not find a trade-off in the earnings benchmark. While AEM is restricted by audit quality, studies such as Zang (2012) and Bushee (1998) find that firms with a greater shareholding of institutional investors will exhibit reduced REM. For example, when firms have a high institutional ownership they observe that they will have a lower chance of cutting back on research and development spending. The argument is that, unlike AEM, REM has negative consequences on the firm's value over the long term, in this case, institutional investors will not be keen on sub-optimal operational activities or practices that would have a negative impact on the firm. Roychowdhury (2006) also found that firms with high institutional ownership will use less REM manipulation to reduce losses. Institutional investors have the means both financially and technically to be able to notice REM activities, they can therefore use their shareholding power and influence to restrain management from these activities.

Another impact of REM as noted by Zang (2012)[13] is that it has a negative impact on the company's tax liabilities and in essence its book tax. For example, REM activities such as overproduction or cutting discretionary expenses increase the firm's taxable profit hence a higher tax bill in the current financial year. On the other hand, AEM will increase the firm's income but not necessarily its taxable profit. Examples include decreasing bad debt expense, decreasing asset write-downs, or recognizing unearned turnover which can have the impact of increasing income but will not necessarily lead to a similar increase in the taxable income for the current financial year. For example, by decreasing the bad debt expense the firm will have lowered its expenses on the profit and loss statement however, this will be added back to the tax computation as the tax authorities will only allow bad debts as an allowable tax expense based on other specific processes such as the debtor going into liquidation and not necessarily a write off on the financial statements. Institutional owners will therefore be very keen on the taxable profit vis-à-vis the tax paid by the firm. Suboptimal operational processes that lead to the firm experiencing a higher tax bill than necessary will be noticed and questioned, in this case, firms with higher institutional owners will avoid REM as this will lead to a higher taxable income. They will therefore find the accruals tax rate much more plausible. Zang (2012) states that for firms with ''higher marginal tax rates, the net present value of the tax costs associated with real activities manipulation is likely to be higher than that of accrual-based earnings management''.

The general argument is that firms in highly competitive industries will use AEM as opposed to REM as it negatively affects the firm's long-term value. Competitive industries that are sensitive to market competition will have certain characteristics such as limited barriers to entry and exit. The companies will also have similar competitive strengths, these firms will therefore fight for the limited funds in the capital market as there are more competitors in the same industry. However, Laksmana and Yang (2014) find that firms in highly competitive industries exhibit a low EM for both REM and AEM. Another reason for firms to prefer REM as opposed to AEM is due to the repercussions that may be meted out if AEM is found out. The financial market will punish firms when it is revealed that their financial reports have elements of AEM. Managers may also have

[13]*This paper also includes REM variables such as the risk of bankruptcy or effects of tax and how these impact the use of REM. I integrate these REM determinants and their influences.*

their bonuses clawed-back in certain jurisdictions. Unlike REM for which managers have the mandate or jurisdiction to implement as it is within their purview. AEM relies on the discretion provided by the accounting standards, these may result in actions that can be taken later on and AEM may be found to be subject to interpretation which conservative regulators may view to be against the accounting standards. In certain countries, this could lead to management fines or penalties such as repayment of bonuses that are considered to have been earned based on improved financials that had been manipulated by AEM. Managers in these countries may therefore be wary of using AEM as they fear that this could be investigated later and if found to have contravened the accounting standards then they would be held liable. Chan et al, (2014) note that many companies have been incorporating clauses in their contracts that allow for the recovery of compensation if found to have been paid based on misstated financials, they refer to this as ‘’claw backs’.

They note that amongst the Russell 3000, there has been an increase from 19 to 144 firms between the years 2005 to 2009 for firms that have instituted claw backs in their contracts. They state that the ‘’Dodd-Frank Wall Street Act 954 ‘’requires the Securities and Exchange Commission to direct stock exchanges to prohibit the listing of companies that have not implemented compensation claw back policies’’. They claim that these clauses give the board of directors powers to ‘’recoup compensation paid to executives based on misstated financial reports’’. They observe that one of the reasons for the increase in the use of claw backs amongst firms is that they are considered to have the effect of reducing misstated financial statements and provide a strong safeguard against managers trying to use AEM. AEM is avoided for the fear of litigation, Cohen and Zarowin (2008) observe that ‘’since accrual-based manipulation is more likely than real activities to be detected and therefore punished, greater perceived litigation penalties should increase the tendency for real earnings management’’. Furthermore, Chan et al (2014) find that managers may be averse to AEM if they believe that their compensation would be clawed back in the future and if they were deemed to have been obtained from low-quality financials. In such instances they opt for REM, this is because the decisions undertaken involve operational business decisions under their discretion and mandate for which the claw back does not apply. The inclusion of claw backs therefore leads to a substitution of increased REM and a reduction of AEM. This view is also supported by studies such as Babenko et al (2012) and Chan et al (2014) who conclude that AEM decreases with the adoption of claw back with REM taking its place and increasing, thus when combining AEM and REM to form total-EM that is production costs, cash flow, and discretionary expenses they find that this ultimately increases even with claw backs due to the substitution of a greater increased REM than the declining AEM. This is also consistent with Zang (2012) which as discussed earlier found that managers use AEM and REM as substitutes.

Chan et al (2014) also provide empirical evidence to show that managers within such jurisdictions for which claw backs are applicable have been seen to substitute REM for AEM. Their study shows that these firms opt for real transaction methods such as reducing research and development expenditure. They further note that these actions are much more observable for firms that have short-term performance targets or those with high transient institutional investors or those with high growth. They however also note two things, firstly the augmented performance due to REM such as enhanced profitability or stock performance is only for the short term and does reverse

within the subsequent three-year period. Secondly, the net effect of EM does not decrease when the claw backs are instituted, the reason being that the decrease in the use of AEM is counter-acted by an equivalent increase in REM hence there is no overall decline in the use of EM. Other studies also support the claim that claw-backs reduce financial misstatements, they show that these clauses are strongly backed by investors and are viewed positively by external auditors thus reducing the energy expended when auditing such clients (Dehaan et al (2013) and Chan et al (2013).

AEM can also reach its limits, thus there will be no further wiggle room. There does come a point when the firm has utilized this option to maximum effect and now looks for alternative EM methods such as REM. Barton and Simko (2002) suggest that ''aggressive AEM is constrained by the cumulative nature of accruals''. This implies that managers may turn away from AEM when the boundaries have been reached and this tool is no longer viable. They observe that the reversal effect can act as a constraint to EM in that the balance sheet is a growth of previous entries be they assets or liabilities, therefore the level of net assets as at a certain financial period will reflect the extent of previous EM decisions. They find that ''managers ability to optimistically bias earnings decreases with the extent to which the balance sheet overstates net assets relative to a neutral application of GAAP''. In this regard the space for AEM is restricted when the net assets are overvalued, this is observed by the limited size of the positive or negative residuals. I will discuss further in the methodology section of the paper on the measurement of AEM and how to determine the sign of the residual which provides evidence of either increasing (positive sign) or decreasing (negative sign) EM. In such circumstances when AEM is constrained but the incentives for EM are still compelling then firms will substitute this for REM.

It is for these and the mentioned earlier reasons that organizations substitute REM for AEM. In this scenario, the firms may first use AEM then once they are unable to apply it further they may now turn to REM. Managers will have a pecking order in that they will use AEM then when the costs outweigh the benefits they will then use REM. Badertscher (2011) finds that ''managers engage in accruals earnings management in the early stages of overvaluation before moving to real transaction management, to sustain their overvalued equity''. In his analysis, the duration of the over-valuation of the firm is directly related to the management's EM methods. Therefore the longer the firm is over-valued the greater the potential for managers to engage in the most egregious method of EM, in this case, non-GAAP EM. The incentive for this is derived from Jensen (2005) in that once a firm's equity is over-valued then managers seek various ways through which they can sustain this valuation with EM being one of these methods. They engage in this to maintain their profitable stock options or bonuses which are tied to the firm's equity. He goes on to state that ''while earnings management activities often fall within the boundaries of GAAP, other more egregious earnings management activities can fall outside the boundaries of GAAP and in some cases, destroy value'', managers transition from one EM tool to another and if this is not enough they play outside the line and breach GAAP rules.

However certain studies find that this substitution may be temporary and does reverse after some time, even though REM may improve performance in the short term the temporary augmentation will disappear afterward. Thus firms will alternate between the two types of EM methods depending on which one has greater benefit than the cost of implementation then once this method

becomes constrained they will substitute it for its alternative. Bhojraj et al (2009) and Cohen and Zarowin (2010) agree with this view and find that the temporary and short-term increase will revert to the pre-managed levels after a while. Bhojraj et al (2009) observe that firms can use EM when they are under pressure to meet or beat analyst targets. This will have a short-term impact as the stock price will be enhanced and the firm will be viewed favorably by investors on the other hand they also find that in the long run firms that beat analyst's expectations with low-quality financials will underperform those that have missed their targets with high-quality reporting. The short-term nature of a manager's performance goals and intentions makes REM appealing even though it would have a negative impact over the long term. Cohen et al (2008) observe that even though REM is much more costly firms did use these methods in the post-Sarbane Oxley period as compared to AEM which declined. They claim that one of the reasons for this is due to the difficulty in detecting it as compared to AEM which would be under focus, especially in the post-Sarbanes Oxley period. The attractiveness of REM to managers is evidenced by Graham et al (2005) who submit that 80% of executives of US firms who participated in the survey admitted that they would rather use REM to meet short-term earnings even though the long-term negative consequences would be detrimental to the firm. The downside to utilizing REM is that it has negative effects on a firm's cash flows and for this reason firms that need to show higher generating cash flow ability will avoid this technique. Merton (1974) finds that bond value is positively related to the market value of the firm, this market value is computed as a function of the discounted future cash flows (Brealey and Myers, 2003). In this case, REM can affect bond value negatively by adversely impacting future cash flows.

2.8 CRITICISMS OF EM STUDIES

Admittedly there have been numerous studies on both of these EM methods. For AEM, most papers focus on the discretionary component of the accruals whilst for REM they focus on the abnormal levels of activities such as production costs, cash flow, and discretionary expenses. Certain criticisms have been leveled against previous research and the gaps therein which this thesis hopes to bridge and provide a contribution to the EM studies. There is undoubtedly a vast amount of literature on EM. Researchers agree that it is ubiquitous and that the motivations and incentives to manipulate financial statements are always at play. Researchers are normally keen to study these motivations and how managers use EM to achieve their objectives. Papers focus not only on confirming that the motivations can empirically be shown to result in EM but also on how this is done and what methods are used. Certain proxies for AEM and REM have been developed that enable researchers to investigate these methods. Other papers will improve earlier methods when they need to study a specific EM phenomenon that previous formulas are not fully or wholly able to provide empirical results.

The drawback of previous papers is that their analysis did not consider the macro-economic environment such as a global financial crisis period while the few that did only examined AEM. Studies such as Cimini (2015) on EM during the financial crisis and its impact on European firms. Ming et al (2007) on the Asian financial crisis. Habib et al (2013) on the 2008 financial crisis on distressed firms in New Zealand. Akindayomi (2012) study on EM on Nigerian firms during the 1990 financial crisis and Huizinga and Laeven (2012) on accounting discretion during the financial

crisis of US banks. These papers have examined EM during the financial crisis on different levels and provided us with a good understanding of how firms use EM during this time. However, they do not compare both EM methods but use AEM models thus accentuating the criticisms leveled against EM studies. One study that has come close to investigating REM during the financial crisis is Eng et al (2019) which studies REM in family-owned firms during the financial crisis between the US and China however it also falls short as it does not compare this to AEM. Another paper that investigates both AEM and REM during the financial crisis in China is Xu et al (2016) however there are certain differences to this paper. Firstly they use the average of the residuals while I separate the positive and negative residuals for AEM and examine them separately. Secondly, I investigate data from UK firms and also from a dissimilar macro–economic motivational background that is the decline in liquidity while they analyze Chinese firm's EM methods from a government funding background.

Xu et al (2016) found that top Chinese firms did engage in EM during the financial crisis, firms in the construction and airline industries used both AEM and REM and manipulated earnings upwards. On the contrary firms in the household industry did reduce their earnings by use of earnings-reducing methods. Their study observes that these results were due to the Chinese government stimulus package. The difference in this thesis approach is that I provide evidence from previous empirical findings that even though there was government funding to banks this did not eventually result in an increase in liquidity to firms or a swift return to the pre-crisis levels. I also provide a distinct methodology for the sample by separating the firm's size based on market capitalization as opposed to net assets which was their approach. I also investigate the effect of debt levels and declining liquidity on a firm's use of EM during the financial crisis as well as involving the use of working capital ratios. I also don't use the means of the absolute value of the residuals for AEM and REM however I separate the positive and negative residuals for each year and analyze them separately then go further to do a time trend analysis for the data. The absolute values are included in the descriptive statistics as first-order results however the inferential statistics does not take this approach. This study also uses different control and dummy variables for AEM and REM and investigates how these constraints impact the use of either EM methods. I therefore provide a different perspective of the use of EM during the financial crisis which is up to now a gap that has not been investigated in this way to date. These approaches may not only apply to the Xu et al (2016) paper but I provide this difference to show the contribution of this paper as compared to other studies on EM during the financial crisis which makes it the most distinct such research to date that examines EM during the financial crisis in this way.

This study avoids these criticisms and contributes to EM literature by plugging into these gaps. I investigate both AEM and REM during the global financial crisis at the firm level while considering the macro-economic changes that took place and altered the firm's operating environment. At the same time, they had to cope with the decline in liquidity of the financial markets. I examine the data from these points of view. I form a dual hypothesis in that managers may use either AEM or REM. The hypothesis stems from the fact that firms will have varying characteristics thus different space or room to use either form of EM. For example, as discussed earlier, firms in high litigation industries will avoid AEM while those in competitive industries with low market share will also avoid REM. I therefore investigate both methods for the sampled

firms. I discuss this further in the methodology segment of the paper and how I separate the positive and negative residuals for AEM and correlate this to their REM equivalent for abnormal production costs, abnormal cash flow, and abnormal discretionary expenses

2.9 FINANCIAL CRISIS SETTING

Historically there have undoubtedly been several financial crises, examples in the 20th Century include the economic recession in the US in 1907 due to the bank's failure followed by the subsequent World War I economic recession. The OPEC energy crisis in the 1970s that was occasioned by fuel shortages in the developed countries. The 1980s also had several financial crises such as the banking crisis in Israel 1983 and the Japanese real estate and stock market price deflation in 1986. These were followed by the sudden and unanticipated stock market crash in New Zealand in 1987 popularly known as ''Black Monday''. In the 1990s there were also several financial crises mainly characterized by the economic recession in the early 1990's. This economic recession originated from the previous policies adopted by central banks that included raising rates in several countries which were meant to curb the rising inflation. Unfortunately, these policies led to a negative impact on firms and consumer spending. The effect was felt far and wide in several countries and continents. There were also other financial crises in the 1990s such as the Asian financial crisis in 1997 occasioned by the financial decline in Thailand due to the decline in the currency (Thai Baht) that then spread to other Asian countries. The period of 2000 to date has been characterized by the Dot Com Bubble in the year 2000 whose genesis was from the technology sector that had previously seen massive growth and speculative investment which came drastically tumbling down and significantly impacting the US stock market. Another recession that is the focus of this study is the widely documented financial crisis of 2007 to 2008 arising from the subprime mortgage crisis in the US which then spread to other countries and negatively affected the world economy. As I write there has just been a medical health pandemic whose economic impact and adverse consequences have been felt far and wide throughout most of the countries around the globe, however, the extent of the damage and financial decline is yet to be fully documented as countries have just gone through this unfortunate time.

Claessens et al (2010) note certain similarities between the previous financial crises, they are clustered as four identical events. Firstly is the increase in asset prices, followed by a credit boom then an expansion in the mortgage market, and finally the regulation and supervision of the financial markets could not keep pace with the developments. Ultimately there is a burst in the system with investors suffering significant losses. Previous literature has also classified financial crisis into two segments, those of a monetarist view (Friedman and Schwartz, 1963). They assess bank panic as the genesis of a financial crisis in that there is a shrinkage of the money supply that then leads to the contractions of economic activity while the second view is the proponents of the decline in asset values who describe a financial crisis as a period characterized by a decline in asset prices, failure of financial or non-financial firms, upheaval in foreign markets or deflation or disinflation or a combination of any or all of these factors (Kindleberger, 1978 and Minsky, 1977). The financial system works in a way that it directs funds from those with excess liquidity to investments or economic agents who have the most productive opportunities. An example is the banking industry which receives deposits and savings from its clients and by pooling this lends to

businesses that have a sound financial prospect or project. A financial crisis interferes with the smooth functioning of this system. It impedes the necessary equilibrium needed in the financial market to be able to channel funds to the agents with the most worthwhile investment opportunities, the reason being that investors either withdraw funds from the financial system or divert them to what they consider safe due to a change in the perception of risk. Mishkin (1992) observes that a financial crisis interferes with the activities of a sound financial system and vibrant economy by driving investments from high output to non-optimal assets. Investors seek what they consider safe investments such as government bonds, gold, or stable organizations. In normal times investors may not be as risk averse they thereby invest in certain classes of assets.

A financial crisis inherently reveals certain occurrences such as the declining liquidity in the financial and money markets either through waning in investments such as losses in mortgage securitization, investors reverting funds to developing and emerging markets, or banks and other financial institutions not lending to each other. The 2007/2008 financial crisis exhibited stark deterioration in economies around the world and significant impairments and erosion of value in assets. Blankenburg and Palma (2009) provide evidence of the extent of this. For example, the amount of toxic debt in Germany was estimated to be greater than USD1 trillion. The European Union projected a contraction of 3.4% in 2009 with leading economies such as Germany and France bearing the brunt. US write-downs in assets were expected to be USD2.7trillion but ended up close to USD9trillion. Losses from equities, corporate bonds, businesses, and home-losses could be estimated to be USD40trillion in the US alone. The extent of these events on the financial markets and financial institutions cannot be understated. Bernanke (2009) states ‘’in the weeks that followed, several systematically critical financial institutions would either fail or come close to failure, activities in some key financial markets would virtually cease and the global economy would enter a deep recession’’.

Bernanke (2009) goes on to observe that the failure of large financial institutions such as Lehman Brothers or the near collapse of others such as American International Group (AIG) which was a counter-party to many of the world’s largest financial firms exacerbated the plummeting in the confidence in the financial systems with creditors, customers, and counter-parties applying heavy pressure on the financial institutions to settle their obligations. This intensified the liquidity problems within the industry as experienced by Washington Mutual and Wachovia. Others such as HBOS in the UK had to merge with Lloyds TSB or in the case of Fortis had to be nationalized by the governments of Belgium, Luxembourg, and the Netherlands. The decline in liquidity was quite severe, for example, the Swedish government had to guarantee bank debt to encourage wholesale deposits but ultimately had to inject capital as this measure was not enough. Other countries such as Iceland could not save their three largest banks and had to be put into receivership. As Bernanke (2009) notes the liquidity crisis eventually found its way into the money and capital markets thus affecting the ability of firms to access financing with equity prices falling and credit spreads snowballing, the conditions for funding deteriorated sharply.

Another manifestation of the financial crisis is the inability of investors to discern properly the asset values, this is more so for financial institutions. This period exhibits a change in the perception of risk and confidence as institutions and information previously thought to be reliable

are proven to be defective. An example of this can be observed from the decline in the use of rating agencies (Hill, 2009)[14] who have access to private information and have also been quoted in numerous papers as being central to the financial crisis. The financial stability report (IMF, 2008) attributes the failure of credit rating agencies to ‘’methodological shortcomings’’, these include inadequate historical data that increased significantly the under-estimation of risk which is fundamental in structured finance products. White (2010) notes that the historical review of the 2007/2008 crisis will judge Moody’s, Standard and Poor’s (S&P), and Fitch which are the three largest US–based credit rating agencies as being primary and principal parties to the financial crisis debacle. This is because their favorable bond ratings provided the grounds for the increased sales of bonds that had been securitized from the subprime residential mortgages. These ultimately ‘’provided an important underpinning of the US housing market of 1998-2006 and the self-reinforcing housing bubble’’.

Jie He et al (2011) observe that at the heart of the 2007-2009 global financial crisis was the explosive growth of private, non-government-sponsored enterprise (GSE) backed mortgage securities which not only fueled the growth of subprime credit and the housing boom but was also fueled by it. They note that ratings agencies which play a central role in the fixed-income market were fundamental to the financial crisis. The reason for this is that they have access to privileged information on securities. Additionally, their issuers were protected from regulations such as that related to fair disclosure and lack of independence. A view was also observed and supported by Hull (2012). One of the tools that was used by financial institutions was to pool the investment into one vehicle thus obtaining a higher rating than would have been achieved if the assets were evaluated individually. For example, an investment that would ideally be rated as BBB would be pooled into an investment vehicle with other assets of a much higher quality this is also defined as a collateralized debt obligation. The amalgamation would result in the entire investment achieving a triple-A rating. Once the rating agencies graded these assets at AAA standards the financial institutions would then be able to market them at a higher price without the need to reveal the entire assets underlying the investment. The problem with this is that the market or investors were not so much purchasing the investment but rather they were safeguarded by the underlying rating that had been given to the asset. They reasoned that the credit rating agencies would have undertaken the analytical work before judging the asset as a high investment grade hence it would be a safe bet for investment. The trust in the credit rating agencies’ analysis was therefore fundamental for the growth of the CDO market.

On the other hand, this trust would also lead to a lack of independence as the investment firms selling these assets did not see the need to disclose what was contained in them, what was important was to obtain a high rating from the rating agencies as that is what the market-determined as essential for investment. As a consequence, the mortgages that were of a poor financially and technically underpinning and would be of an unsound basis could be sold as a pool with other

[14] *Hill (2009) states that as of February 2008, Moody's had downgraded at least one tranche of 94.2%. As of March 2008. S&P had downgraded 44.3%. As of December 2007, Fitch had downgraded approximately 34% of these subprime tranches*

high- quality investments of which the investor would not be fully aware. These became apparent when the financial crisis occurred revealing the misplaced trust that had been positioned in the rating agencies. The evidence from the post-crisis period shows a decline in the use of credit rating agencies by certain sections of investors. One of the limitations in investigating the quality of ratings agencies is that this is measurable in hindsight hence we may not be able to detect elements observable in the current setting that could enable us to make better decisions at that time. White (2010) observes that the use of ratings agencies and the grading is based on the perceived quality of the agency and its methods. This enables them to build a reputation, however, this only becomes evident after the fact hence we may have impediments aligning it to current events. DeHaan (2017) finds that there is a subsequent decline in the use and reliance of credit rating agencies by sophisticated market participants. They explain this to be due to the theoretical model of reputational cyclicality in that the reputational damage from the failure of credit rating agencies was far more emphasized by sophisticated market participants. However, they also find that there is no evidence of the decline in the use of credit ratings by other market participants during or after the financial crisis. They observe an increase in the credit rating agencies' performance after the financial crisis. One of the reasons for this would be that the ratings agencies instituted corrective measures as a result of the failures which were accepted and welcomed by the market.

A financial crisis period exhibits a sharp decline in liquidity which is intensified by the change of perception of risk investors as previously trusted information and institutions are found not to have been reliable. Stiglitz and Weiss (1981) demonstrate that the asymmetry of information and resulting adverse selection leads to credit rationing, borrowers are denied loans even when they are willing to pay a higher interest rate. The altered perception of risk during this period inhibits lending between banks and the freezing of credit to certain clients. Alan Greenspan in his speech at Georgetown University notes that trust is essential for day-to-day business just like one would trust their pharmacist who fills the prescription or the automaker who certifies the roadworthiness of a vehicle. However, during the global financial crisis, there is a shift in the investor's and financial institution's perception of risk for example they deviate from seemingly risky investments such as small firms or even venture capital. Block et al (2010) find that there is a decrease in the funding for start-ups and new ventures during and after the financial crisis, this they state creates a ''funding gap''. The different approach and assessment of risk during this time coupled with the declining liquidity led to the absence of lending between banks and businesses whilst providing a fertile ground for managers of firms to manage earnings to improve performance to show that they are weathering the storm of the economic downturn and performing much better than their peers. This enables them to access the limited funds that are still available and avoid restrictions on their credit lines. They also do this to seek to obtain positive ratings by analysts thus improving their attractiveness for investment.

2.10 FINANCIAL STATEMENT SIGNALING DURING THE FINANCIAL CRISIS

International Accounting Standard number one sets out the overall requirement of financial statements, these also relate to the structure and content. The financial statements in this regard refer to the statement of financial position, statement of profit and loss, statement of changes in

equity, statement of cash flows, the notes to the statements that defined the accounting policies, and other explanatory information. If a firm has applied an accounting policy retrospective then there needs to be a statement of financial position comparing the preceding to the current period in the event that it reclassifies items in the financial statements. The objectives of financial statements are captured in its conceptual framework in that the financial statements are to be useful in aiding various stakeholders to make informed decisions. These stakeholders include creditors when deciding the level or duration of trade credit that can be extended to a firm. Lenders such as financial institutions analyze whether a firm is able to obtain financing or for those with facilities to determine if they can service them consistently. For investors and shareholders to decide on whether to increase their stake in the firm or if they should retain their investment or dispose of them. The characteristics that are deemed necessary for financial statements to provide useful information are understandability, timely, verifiable, relevant, and faithful representation. By providing financial statements that have these characteristics then a firm is able to offer information about the annual performance in a form that is of benefit to the various external and internal stakeholders.

As already discussed, financial statement manipulation is one tool that is used by firms to achieve certain motives and objectives. Nelson et al (2002) state that managers are normally aware of opportunities for EM, but other studies such as Sloan (1996) and Xie (2001) observe that investors are doubtful to be able to see through this. Some may argue that the incentives and opportunities for engaging in EM during a financial crisis for firms may not necessarily be distinct to normal times but they nevertheless provide compelling reasons for managers to manage earnings either via AEM or REM. Some of these motives such as maintaining or increasing management compensation or meeting or beating analysts' forecasts may still be relevant during the financial crisis just like they are in normal economic times. However, I hypothesize is that during a financial crisis, a distinct incentive to engage in EM is for firms to show their trading partners and funders that they are still stable and have not been adversely affected by the global financial crunch as compared to others. They therefore have much greater growth prospects, receive better ratings than their peers, and are able to show that they can service their current debt without default additional that the managers deserve their current compensation or even better terms. Managers do this so as to be able to attract the limited available funds that are being directed towards ''safe'' organizations and to dispel the market's fears regarding their performance. This is especially critical during this financial crisis period as the funding could be the difference between remaining in business and going burst given the macro-economic conditions at play.

Financial statements provide an avenue not only through which organizations disseminate information on financial performance but also to show the various stakeholders where the company is at the moment and what are the prospects. Ultimately this is to enable the stakeholders to make decisions. Benjamin and Stanga (1977) list the external parties to include ''financial analysts, stockholders, and potential stockholders, bankers, bondholders and potential bondholders, employees and labor organizations, customers, suppliers and potential suppliers, tax authorities and regulatory agencies, social action groups and the general public''. The expectation is that these groups have various objectives and thus extract different information or content from the annual reports. For example, firms would want to attract positive ratings from analysts. Previous studies

such as Skinner and Sloan (2002) and Sloan (1996) show that negative analyst ratings can be detrimental to a business even when they miss analyst's expectations just by small margins. Managers therefore try to communicate the financial performance and other internal operations to these stakeholders mostly in a positive manner so as not to be punished but to improve the firm's image and future interactions. Financial statements thus act as a form of a signal to the market, an example is increased profits and dividends announced at the same time by a firm that provides a positive signal to the market in that the managers are confident of generating free cash flow from future trading and they are therefore able to pay back their shareholders from the generated profits of the current year as they are buoyant of the financial forecasts.

Firms will therefore try as much as possible to provide positive information rather than negative news about their financial performance. The signaling theory[15] as discussed by Spence (2002) and also Kim and Verrecchia (2001) provides evidence that if it is beneficial then organizations will fundamentally disclose positive performance to show their quality as opposed to vice versa. Managers do this to try and reduce information asymmetry (Healy and Palepu, 2001, and Zhang and Wiersema, 2009). Other studies show that there is a reward for a positive disposition and sanctions for a negative outlook. Leuz and Verrechia (2000) demonstrate that positive information improves a firm's stock liquidity. Healy and Palepu (1995) show favorable conditions in equity issues and Francis et al (2005) observe increased attention from financial intermediaries when there is positive information. However, Barton and Simko (2002) find that investors react negatively when firms have negative information such as failure to hit targets even if it is by a small amount. Moore et al (1961) show that the probability of a company to obtain a loan is closely related to the level of its profitability ratios. This signaling effect exerts pressure on managers to disseminate positive information to external parties, who will reward positive news or punish negative financial performance.

There is a hypothesis that this pressure is compounded in a financial crisis where investors have suffered losses and those who may have been lucky to have escaped with some investments flee to safety by either migrating their limited funds back to developing and emerging markets or to government bonds or to firms which they consider to be ''safe''. Banks and financial institutions are in deep distress and avoid lending to each other and to ostensibly risky clients. In the pre-crisis period, firms invest in expansion, research and development and capital expenditure as credit is cheap. They therefore may not feel the need to maintain cash but would rather invest or even buy back stock or increase dividends. However the crisis period and immediately after, they may require investments to maintain these projects, for working capital or to bridge deficits encountered from declining sales. Managers also need to provide stronger justification for the payment of bonuses or greater compensation as businesses cut down on payroll costs. At the same time other companies with debt covenants will fear that with the declining liquidity, financial institutions will seek to institute restrictions on firms that they feel are unable to service their debt. EM is thus an

[15] *Firms will use financial statements as a way to signal to shareholders. These metrics will include profits and dividends that show a positive outlook to generate cash flows. Others include revenue growth, profitability ratio, or low debt ratio. These signals are positive to the market.*

attractive option in this turbulent period where managers encounter a double quandary in that not only is access to funds limited but they also face a depressed consumer market which further negatively impacts their ability to increase prices or grow sales volumes that would improve working capital or organically finance their activities. The financial statements provide an avenue to send signals to the various stakeholders as would be appropriate to provide evidence as to the stability of the firm and the soundness of its financial footing despite the economic recession. I provide empirical evidence from other papers that show that there was actually a decline in lending and finally the research contribution for this paper that examines EM as a form to improve performance so as to obtain these limited funds.

2.11 BORROWING AND LENDING

This study investigates the use of EM during the financial crisis. However, the backdrop of this is the decline in liquidity and funding from the relevant financial institutions. I have provided a discussion from other papers on the decline in the stock market and financial products such as commercial papers and also on the reasons why the government injection of cash into the financial and banking system did not necessarily result in greater lending to businesses. In this segment, I provide empirical evidence to show that there is a decline in lending by banks and financial institutions during the financial crisis period. I have not obtained the data and analyzed the same or provided a methodology or formulas for analysis. However, I use previous studies and interpret their findings that support this claim of declined lending. Previous reputable studies provide sufficient proof of this and thus are a reliable tool for referencing. It also provides more space for this study to focus on its core theme of EM during the financial crisis and delve deeper than it would have if I would have had to obtain the data and analyze whether there was an actual decline in liquidity. I discuss this evidence briefly in this section to answer the question of whether there was actually a decline in lending.

Ivashina and Scharfstein (2010) claim that during the financial crisis, lending to large borrowers declined by 47% from the pre-crisis levels which is the fourth quarter of 2008, and even more (74%) as compared to the peak of the credit boom period. Their research involves investigating the role of the financial crisis and the subsequent bank panic and its effect on bank loans and the supply of credit to the corporate sector. They specifically examine the effect on syndicated loans that is ‘’bank loans in which a lead bank originates’’ a loan and lines up other financial institutions to share a portion of the loan. They observe that this is not necessarily a new form of lending but has grown and evolved over the last 30 years. They show that the decline in syndicated lending began being witnessed in the mid-2007 period, these accelerated and reached its peak in the second half of the year 2008. They go on to show that the fall in lending was far and wide and included all types of loans from ‘’ investment grade to non-investment grade: term loans and credit lines: and those used for corporate restructuring’’. They further claim that bank’s syndicated lending is correlated to their funding base. Thus banks with ‘’more deposit financing cut their syndicated lending by less than did banks without as much access to this, more stable source of funding’’. A bank with a median deposit-to-asset ratio reduced its monthly number of loan origination by 36% in the period between August and December 2008. They further state their findings ‘’are consistent with a decline in the supply of funding as a result of a bank run’’. Their data sample covers banks

with large loans for which most are syndicated, the mean and median size of the loans were USD467mn and USD185mn respectively while the borrowers for these loans had mean and median sales of USD3.2bn and USD 0.5bn respectively.

Hogan (2019) also investigates the reasons for the decline in bank lending during the financial crisis period. He examines why there was still a significant decrease in bank lending even though there was government intervention to try and inject cash into the financial system. I have already discussed this in the earlier chapters so I will not replicate the same. However, I look into the empirical evidence from this paper that shows the decline in banks' lending. I obtain the data and graphical analysis from this paper to provide further evidence that there was a decline in banks' lending hence a liquidity crisis during the financial crisis period. The graphs below derived from Hogan (2019) show the total loans advanced from the US banking financial system between the years 2000 to the end of the year 2017. As can be noted from these graphs, there is a steady growth in the 2000s from USD 4trillion which then peaks in the pre-financial crisis period to USD 8trillion. There was then a decline in the financial crisis years 2007 and 2008 then the growth resumed from 2011 but at a much slower pace than witnessed in the early 2000 period to the level of USD10 trillion in the year 2017.The figure 1 below also shows the trend from the years 2000 to the year 2008, this shows what would have been expected to have happened had there not been a financial crisis. If this would have been the case then the anticipated lending would have surpassed the USD17 trillion mark by the year 2017.

Figure 1**: Bank loans and bank assets for the pre and post financial crisis**

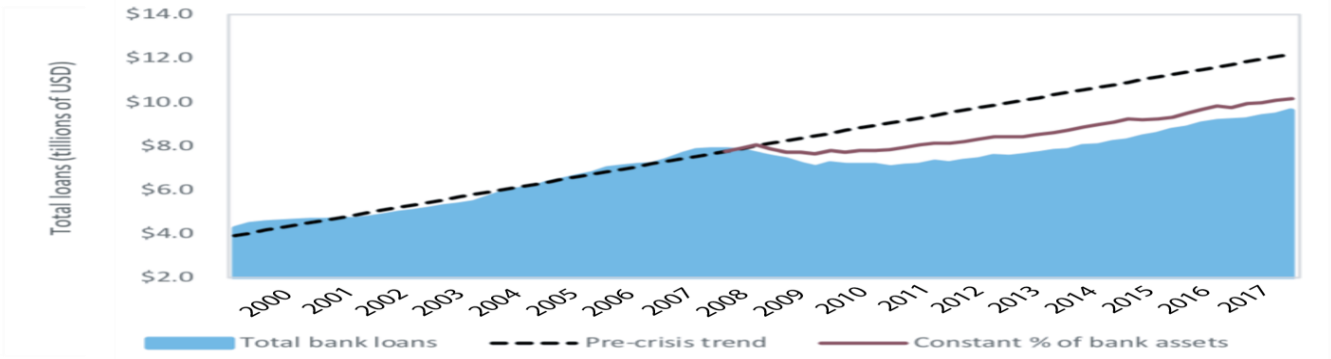
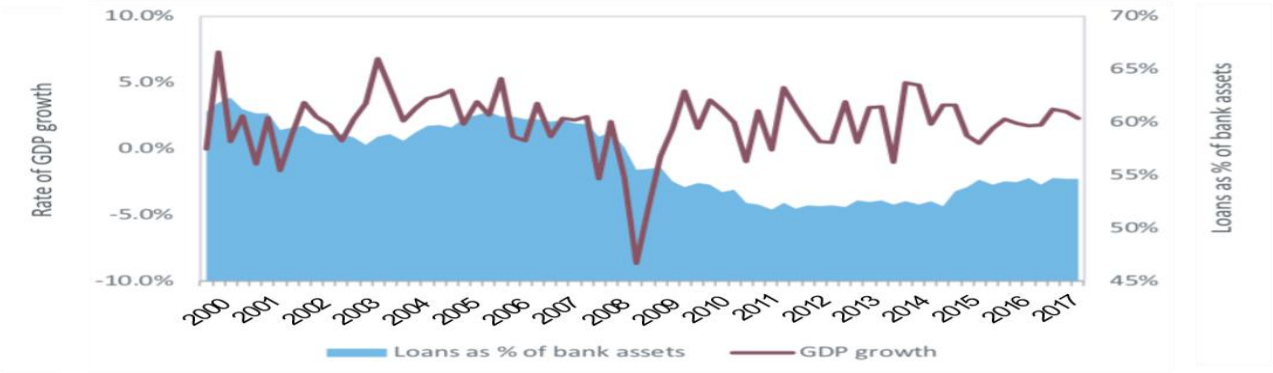


Figure 2**: Bank assets and GDP Growth for pre and post financial crisis**



Additionally, the solid line from Hogan (2019) in Figure 1 shows what the lending as a percentage of the bank's assets would have been if the growth had been maintained at the same level as the pre-crisis level without the effects of the financial crisis. These estimated loans are over and above the actual loans for the period after the financial crisis. The figure 2 shows the rate of GDP growth from the year 2000 to 2017 to the loan as a percentage of bank assets from the year 2000 to 2017. Hogan (2019) expounds further on some of the reasons for this decline in bank loans and lending which include an overall reduction in GDP and economic activity such as employment or production. I have provided these as I regard that it is worth referencing the same as evidence of not only the decline in liquidity in the financial system but also the overall impact and effects of the financial crisis. They also observe in their paper that there is a strong correlation between GDP Growth, job growth, loan demand, TED Spread, regulatory restrictions, and excessive reserves to bank loans. All the metrics apart from TED spread have a strong negative correlation to bank loans. The data in Hogan (2019) is obtained from the bank's quarterly reports as published by the call reports that is Reports of Condition and income which is available from the Federal Deposit Insurance Corporation (FDIC). The total loans for the banking system is the summation of the individual banks' loan book for each quarter.

Another paper that provides empirical evidence on the decline of lending during the financial crisis period is Acharya and Mora (2015) who show that there was a decline in banks' lending that resulted in small and medium-sized firms either drawing down on their credit lines while those that did not have this facility seeking to use trade credit as a form of financing. They observe that at the start of the financial crisis deposits or inflows to banks declined thus their loan-to-deposit shortfall expanded. Admittedly this ratio was wider for banks that were exposed to greater undrawn commitments. Furthermore, with the private funding decline at this time of the financial crisis, the banks were unable to offer higher rates that would attract deposits, which eventually led to the decline in credit. Their main finding is that before the injection of funds by the government there was a decline in liquidity and lending by the banks as the infrastructure necessary for them to lend to the market by attracting inflows broke down. They note that this was the case not just for the weakest banks but for the entire industry. From Acharya and Mora (2015) I include figures 3 and 4 that show the movement in the bank rates from the year 1997 to 2009, it shows an increase in rates during the financial crisis period that is meant to attract deposits into the banking system.

Figure 3: **Deposit and loans for small banks for the period 2007-2010**

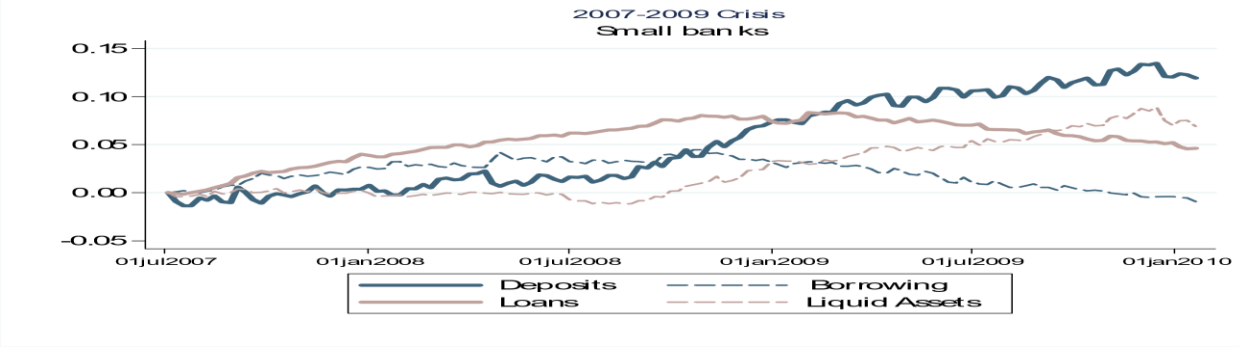
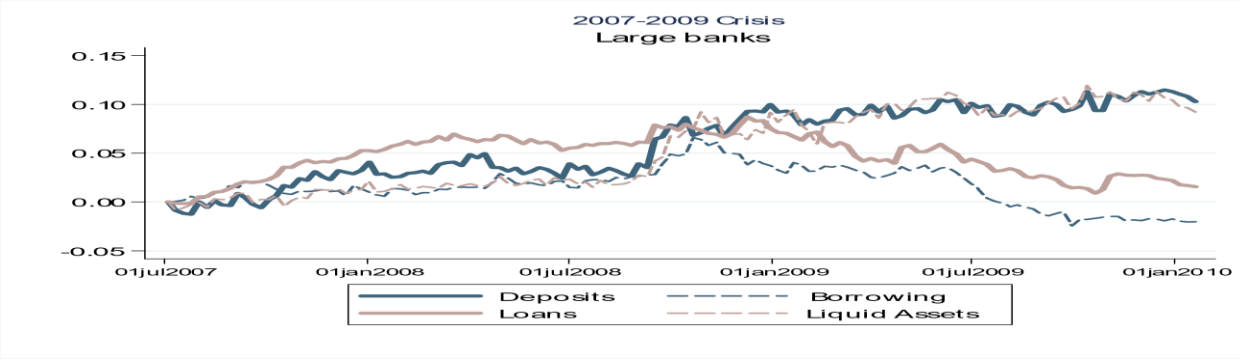


*Figure 4: **Deposits and Loans for large banks for the period 2007-2010***



The weak institutions offered a much higher rate than their competitors however the other banks still increased their rates. The need for deposit is also more pronounced for banks that have credit commitments, these banks offered higher rates than those with less commitments. Despite raising rates, the ''commitment exposed banks'' still had less deposits and were unable to attract this form of funding. The banks eventually had to cut back on new credit. The figures 3 and 4 above show the shortfall between the balance sheet lending and deposits which as can be seen widened during the financial crisis period. They also demonstrate that liquidity-exposed banks cut back on extending new loans to their customers, which reveals an overall decline in credit and loans offered. They obtain quarterly data from the years 1994 to 2009. The data is derived from the quarterly call report data, the panel is of approximately 7000 banking organizations for which they control for merger effects by excluding a bank's quarterly report when the growth rate of a bank's assets exceeds a ten percent threshold. They also control for other solvency and liquidity measures such as ''net wholesale funding, non-performing loans, capital, real estate exposure, and size''. Undoubtedly, several other papers also provide results for the decline in lending during the financial crisis period however these three papers and their results given their depth and sample size should provide sufficient evidence of decreasing liquidity and support the background for which this paper is premised.

2.12 RESEARCH GAP AND CONTRIBUTION

This research provides a deeper understanding of EM as it pertains to the financial crisis period. Undeniably, various papers examine EM in normal times and others during the financial crisis which offer us a good understanding of EM in both times, this thesis extends the work already done in this arena. This paper examines both EM methods that is AEM and REM by UK-listed firms during the financial crisis. I seek to investigate whether firms still use AEM or if they shift to REM given the restrictions on AEM as already outlined. Unlike previous studies that have investigated EM during the financial crisis in general this paper views the financial crisis from the declining liquidity perspective and provides a hypothesis that with the constraint in lending from the financial markets such as commercial papers and banks, would this be a compelling motivation for firms to manage their earnings to signals to the market that they are still strong and able to weather the financial crunch. They should be able to service their current debts thus no need for

any restrictions or to show that they are strong financially and are consequently eligible for much greater credit facilities even from their financiers and suppliers.

Indeed, previous studies have been undertaken on EM during the financial crisis, as already discussed most of these have been on the use of AEM in various countries and continents. One study that has examined both AEM and REM during the 2007 and 2008 financial crisis is the Xu and Ji (2016) study of the use of EM by Chinese firms during this time as a means of attracting the Chinese government stimulus package that was meant to spur firm's growth and provide stability. In their paper they note three contributions to the EM literature, firstly they claim to provide a contribution in regards to the investigation of EM by Chinese firms during the financial crisis which had not been done, secondly, they acknowledge that previous studies have been conducted on EM during the financial crisis mainly focused on AEM but they investigate both cash flow earnings management that is REM and AEM. Thirdly they state that their study provides a contribution by investigating specific industries rather than grouping a cross-section of firms from various industries. This research also borrows two contributions from Xu and Ji (2016) and provides empirical results but from a distinct UK perspective and methodology.

This paper provides two distinct contributions. Firstly is an investigation of EM during the financial crisis. Lin et al (2013) note that EM research is done in normal economic conditions. Filip and Raffournier (2014) also state that EM research does not take into account the economic environment. This paper seeks to close this gap and provides a contribution by investigating EM during the financial crisis as a period of deteriorating economic environment contrary to normal economic times. The deep declining liquidity during the 2007/2008 global financial crisis was a period of severe economic impairment for which normal conditions may not hold and firms would have added incentives to use EM. This paper approaches the financial crisis from a declining liquidity perspective with decreased bank loans and lessening trade credit as well as the added improved financial reporting regulatory environment. The thesis also provides a second contribution which seeks to investigate both AEM and REM during the financial crisis. Irani and Oesch (2016) observe that research on EM during the financial crisis does not include REM. Previous papers only investigate AEM which may provide evidence of declining EM however firms may use REM during this time or they could still use AEM if there are compelling motivations at this time to still use discretionary accruals. I therefore investigate both methods with arguments for increasing and decreasing the income of both methods depending on the examined variables and firm characteristics.

I investigate EM by UK firms during the financial crisis by analyzing the use of not only AEM but also REM. Previous studies that have researched on EM in Europe with the UK included have only used AEM. These papers have tended to agree that there is a decline in the use of AEM during this time. I examine both sides of AEM and REM for UK-listed firms to measure on whether firms would still use AEM depending on their characteristics or if AEM is restricted then they would segue to REM. I investigate firstly whether this decline in AEM is actually true and secondly, if there is a decline then if this is counter-acted by an increase in the use of REM. I also examine whether if there is a decline in AEM then if this decline is for the entire market or if it does depend on the firm characteristics such as size. I therefore segregate the firms based on size that is FTSE

100, FTSE 250 and FTSE Small Cap by use of the market capitalization and analyze these along with the entire FTSE All Share to examine whether they exhibit the same movement in the use of EM or if the firm size has an impact on the use of EM in that certain firms may still have an incentive to use AEM given their financial requirements. While on this I also include several AEM variables to provide a much fuller picture, these include for example the operating cycle and net operating assets which determine the flexibility that the firms have in their operations. Therefore size is not the only factor. However, we also need to incorporate flexibility in the environment that will limit the use of discretionary accruals and also influence the firm's use of AEM. I discuss these further in the methodology section.

The paper also examines firms from a financial constraint perspective and whether this does provide an EM incentive, especially during the financial crisis. This study seeks to investigate if firms that have financial constraints such as high debt levels would have strong motivations to manage their earnings so as to avoid restrictions by banks and financial institutions. These firms could use either AEM or if there are limitations in using this method as already discussed such as from high-quality auditors or the need to reverse accruals then the incentives will be so strong that they will use REM despite its long-term negative consequences on value and cash flow. I use several formulas to distinguish the firms that have financial constraints. One of these is the interest cover. Firms with a low interest cover are in a position such that their profits may not be sufficient to cover the interest payments and vice versa for firms with high interest cover. I also examine if working capital levels also have an impact on the use of any of the two EM methods. I also compute the financial constraint metrics for firms that have both positive and negative residuals for both EM methods and compare the two. Some of the financial ratios include debt to earnings before interest tax and depreciation, debt to equity, and quick ratio.

I go further to provide EM analysis during the financial crisis on both AEM and REM by examining the firms on two distinct levels[16]. I dichotomize the firms between those with positive and negative AEM residuals then compare these to their REM equivalent as well as using a time series regression for the two AEM residuals. This provides us with a better insight into the firms that have an increase or decline in AEM and their corresponding REM behavior. I do this by undertaking a two-stage least squares method which I discuss in much more detail in the methodology section as well as correlations between the AEM and REM positive and negative residuals. I also investigate on the firm characteristics for the companies with both positive and negative AEM residuals. In essence, this paper not only contributes to the field of EM during the financial crisis but also assists in the empirical context by going further to examine the EM methods from a distinct methodology that takes into account the non-stationary nature of the data that necessitates the use of other appropriate statistics such as the time series.

[16] *The paper regresses the AEM against REM to measure the substitution of these for both the positive and negative residuals of the respective firms. The same is done for two-staged least squares as well as the correlation between the AEM and REM to test for the relationship.*

CHAPTER 3: METHODOLOGY

As already stated EM has been widely studied and there are a plethora of papers on this subject. This paper borrows from those research not only on the theme but also on the methods. Admittedly I am reviewing EM during the financial crisis from a liquidity perspective mainly on UK firms, however, some of the formulas and underlying methodology have been acquired from the other papers as these have extensive acceptance amongst the academic and professional community. I engender my approach in terms of the sample that is firm size and how the companies are clustered by using their market capitalization. Nevertheless, the methods and formulas for examining the discretion in the use of AEM and REM abnormal values for production costs, discretionary expenses, and cash flow are obtained from what has been used by other studies. I discuss further in this section. This methodology segment will delve into the hypothesis and what are the testable elements of the same, the sample of the firms and where the data will be obtained from and in what form, the formula and variables that will be used to analyze this data, and finally the mechanisms that will enable us to check for the robustness of the results.

3.1 RESEARCH PHILOSOPHY

To provide a background to the methodology, I regard that it is paramount to this segment to discuss the research philosophy. This is to shed light on the underlying research, the research strategy, the research problem, the data collection, the processing of the numbers as well as the analysis of the same. The earlier segments have already discussed on the underlying research which is EM as it relates to the financial crisis and declining liquidity. The introduction also outlined on the research problem. I therefore discuss on the other aspects of the research philosophy that sets the theme for the methodology. It goes without saying that this paper follows a quantitative approach and with that stated the research philosophies will be within that arena. Saunders and Townsend (2016) note that there are five research philosophies. These are positivist research philosophy, interpretivist research philosophy, pragmatist research philosophy, critical realism research philosophy, and post-modernism research philosophy. I firstly discuss on these five philosophies and which one relates to this paper and thereafter I outline briefly on the research strategy and data collection, processing, and analysis.

Positivist research philosophy in general relates to the view that the ‘’truth’’ is obtained through science which is by observation that is collecting data, measuring and analyzing, and thereafter interpreting. The researcher is objective and does not include their personal views. Interpretivist research philosophy involves social construct and theories. It takes the approach of social perspectives that is through interviews or observations. Pragmatist research philosophy is described as a method that fits and works best under the circumstances. In this approach impractical or unfeasible ideas are not accepted. Critical realism philosophies were initially developed by Roy Bhaskar and opposed positivism research philosophy. It is mainly used in the social sciences and is described as a philosophy that is based on an explicit ontology. Finally, post-modernism research philosophy is explained as a philosophy that encapsulates a mode of writing in which the narration is viewed as against the values and ideas of modernism. In essence, this paper that investigates EM in relationship with the financial crisis declining liquidity is a reflection

of positivism research philosophy. This paper is devoid of my personal views however it is based on the collection of data, analysis of the numbers and providing empirical results on the observation of the same. This thesis seeks to extend further knowledge on both AEM and REM vis-à-vis the 2007/2008 financial crisis grounded on the observation and measurement of authoritative and authentic data that is analyzed in a clear and unbiased statistical process. It is detached from my human feelings, and subjective interpretation and it does not go beyond what is analyzed and observed in the data and results.

The strategy for this paper involves the use of previous accounting proxy formulas to enable us to obtain observation as to the EM in respect to the financial crisis period. The paper will involve obtaining data after which the numbers are calculated through accounting methods which provide the error terms that determine through the sign that is positive or negative whether there is an increase or decrease of EM levels. The strategy of this paper will not involve constructing a new formula or discovering a theory, however, it uses the common formulas that are used from other papers that investigate EM. That is Jones and Modified Jones for AEM with Kothari model for robustness check and Roychowdhury (2006) for REM. I discuss more of these formulas in this methodology segment. These two accounting formulas provide evidence of EM and manipulation of financial statements. The strategy is to use these formulas on the obtained data and within the context of this paper which is between the periods of 2004 to 2018 with 2007/2008 being the financial crisis period. As the formulas are already defined more of the work is on obtaining and processing the data for example by regressions. The paper then compares the results such as descriptive results with other papers and also borrows the methodology processing of data from these papers. These papers include Cohen et al (2008) and Badertscher (2011). I discuss this further in the subsequent segments by first outlining the hypothesis and the questions to be tested and thereafter the data to be obtained along with the appropriate structure of analyzing the numbers.

3.2 HYPOTHESIS

The study focuses on EM during the financial crisis. As already enumerated EM and the incentives and motives have been widely researched however there is a gap in the study of a firm's EM behavior during the financial crisis as pertains to AEM and REM, especially from a declining liquidity perspective. This is for UK-listed firms. Secondly for those of different sizes thirdly for firms with certain financial constraints such as elevated debt levels and fourthly how this applies to UK-listed firms' specific characteristics such as operating cycle and net operating assets for AEM and tax rates and risk of bankruptcy for REM. Contrasted to the previous financial crisis, the 2007/2008 global financial crisis had a severe liquidity decline with banks which are viewed as one of the final alternatives for lending when the stock market and commercial papers decline being at the center of the crisis thus worsening the problem. As acknowledged, government intervention and financial assistance did not necessarily result in increased funding by financial institutions but there was a decline in lending with small firms drawing down on their credit lines while other firms faced restrictions on their existing debt covenants. This included a limitation on the level of activity that firms could undertake such as acquisition of new assets, expansion or limits on increased borrowing.

Given the magnitude of the liquidity crisis and the documented run on the banks in the UK, it is plausible that UK-listed firms used EM during the financial crisis. Even though various previous studies have shown that there is improved quality in financial reporting during this time in order to meet statutory guidelines while at the same time attract greater investments. These studies have not been specifically done on UK-listed firms that is FTSE ALL-Share and its respective constituent indices. Secondly, they do not take into account the weakened liquidity and lending view that would provide an incentive to firms to improve results especially those in constrained positions. The studies done on UK firms have only used AEM, firms may substitute this for REM when AEM becomes less suitable or they could use both methods at the same time. This then provides the background to this study in that, did firms use EM as one of the tools that enabled them to signal to the market that they had a better ability to weather the storm of the financial crisis and come out of it quicker and stronger. Furthermore, did they use EM to be able to maintain their current credit facilities or to attract new financing? Another question is, was the method of choice AEM or REM, and the characteristics of these companies that used either of these methods.

There are various types of hypotheses, these including directional and non-directional, null and alternative hypothesis, inductive and deductive hypotheses. Unlike a directional hypothesis, a non-directional hypothesis predicts a relationship or change between the dependent and independent variables however it does not provide a specific direction of the change or whether the relationship is positive or negative. On the other hand, a directional hypothesis will predict a positive or negative relationship between the variables. A null hypothesis which is normally denoted as H_0.states that there is no statistical relationship between the variables or there is no significant relationship between the observed variables. An alternative hypothesis which is the opposite of a null hypothesis is denoted as H_1 and it predicts that the result of the empirical test will provide the expected outcome. It can further be defined as a directional alternative hypothesis or a non-directional alternative hypothesis[17] depending on whether it will go further to anticipate the nature of the relationships. The final hypotheses are the inductive and deductive methods. Inductive hypothesis generally involves the generation of a new theory whilst a deductive method involves testing and analyzing existing theories. An inductive approach will involve collecting data and then analyzing it to provide results. Once this is done then the observations enable the researcher to generate a theory that will be examined amongst existing theories so that it is now established within the frame of the current body of knowledge. However deductive reasoning will involve testing an existing theory, this would normally start with a general statement which would then be examined and broken down further so as to arrive at a specific conclusion.

This paper will be of a deductive hypothesis as I seek to examine existing theories, furthermore, the hypothesis will be of a non-directional alternative. This is one in that the expectation given the motivations and incentives during this financial crisis time is that firms will still use EM to achieve

[17] *Previous papers have observed there is a decline in AEM during the financial crisis, this study will test both AEM and REM. For this thesis there is no direction, I explain the reasons why AEM may increase or decrease. Furthermore, if AEM declines then REM will substitute it. The motivations to attract limited funds are quite strong compelling for either EM to be at play.*

their objectives. However, I seek to establish whether the firms will use AEM or if the restrictions will be so great so that they would segue to REM. The direction in the movement of AEM and REM so as to improve performance are both plausible as I anticipate this will depend on varying factors depending on the firm's dynamics. I therefore investigate both methods. The over-arching theme will be to test both methods for the three indices that is FTSE 100, FTSE 250, and FTSE Small Cap then examine the results to determine whether there is an increase or decrease and if there is a statistically significant relationship between the positive and negative residuals. For AEM, I test this using the Jones and modified Jones method and Kothari model for robustness check while for REM I use the Roychowdhury (2006). That is the abnormal production costs, cash flow, and discretionary expenses. I also incorporate several variables. This is to enable us have a fuller picture as to the constraints and conditions that may affect a firm's use of the respective EM methods. Even though I argue that firms will still use EM during the financial crisis period given the compelling incentives at this time, I do not initially provide assumptions as to which form of EM. I therefore examine both sides and methods for the three indices.

The development of the hypothesis also stems from the theoretical foundation. The examination of both EM sides that is AEM and REM is from the anticipation that firms will still use EM during the deep declining liquidity therefore when the supply of funds is limited and there is a greater demand for access to these limited funds then EM is one avenue to enable firms to show that they are sound thus access bank loans or trade credit. As discussed in the literature review, previous papers have found a decline in AEM during the financial crisis as firms need to attract quality investment. However, the theoretical framework that this paper is built on provides a foundation that the economics at this financial crisis time would motivate firms to use EM be it AEM or REM. Furthermore, from an agency theory perspective, managers would be incentivized to show that their firms are performing better than their peers, these firms would therefore be able to come out of the financial crisis much better than their competitors. I, therefore, use a non-directional hypothesis to investigate both AEM as the anticipation is that firms would still be inclined to use AEM despite the findings of previous papers. If the results of previous papers still stand then firms would segue to REM as it is also a viable option at this time. This thesis therefore investigates both sides and expects EM to still be a motivation at this time as the economic environment at this time and the need for managers to obtain limited funds, avoid added restrictions on their debt covenants, and finally show that their firms are better than their peers will be at play and support the theoretical framework of both economic and agency theories.

As earlier discussed the principal incurs monitoring costs to safeguard the actions done by the agents. Jensen and Meckling (1976) note that principals incur costs such as the incorporation of a board of directors or auditors so that not only they can monitor the agents but they can also maximize the shareholder value who are the principals. The quality of auditors will affect the type of EM used by the firm. High-quality auditors who have the expertise and experience will be able of detecting AEM and may not be agreeable to this form of financial reporting (Burnett et al (2012). Krishan (2003) and Balsam et al (2003). Firms in such an environment will use REM. Furthermore firms will a significant proportion of institutional investors will also be restricted in using AEM as these shareholders will have the financial muscle to employ qualified professionals capable to detect AEM and they may punish firms for example through claw backs if the financial statements

are found to have AEM activities (Babenko et al (2012) and Chan et al (2014). These examples enable the hypothesis to be developed that firms will use AEM and if this is constrained they will use REM. The use of EM will depend on the firm's characteristics. Another reason for this hypothesis thought is that agents are incentivized by principals which provides motivations for them to perform in the principal's interests. Mitchell and Meacheam (2011) elucidate that agents will perform in the best interests of the principals as they are incentivized by the principals. This is anticipated in the financial crisis in that the firms will try to show that they are still financially strong and able to cope with the financial crisis better than their peers. EM is one avenue through which managers can do this. This is either via AEM or REM.

Additionally, the economic theory also provides a foundation for building the hypothesis. As discussed earlier there was a decline in loans during the financial crisis. Prior literature find that there was a decline in loans during the financial crisis (Hogan (2019) and Acharya and Mora (2015). Other papers such as Borio et al (2010) also find that small firms had to draw down their existing facilities as they could not obtain other or more bank loans. At this time the demand for funds was great while the supply was declining. Furthermore, Mishkin (1992) notes that the financial crisis is a period of imbalance in that funds are directed to firms or activities that are not optimal or do not provide the best productivity as compared to other firms or activities that have better returns. This is because the financial crisis period is impacted by the asymmetry of information that influences this pattern of data. This is compounded by the screening effects. Stiglitz and Weiss (1981) in their economic theory of credit rationing or equilibrium rationing depends on the rate of return for the loans. Just like the agency theory, the economic theory also provides a strong framework for the development of the hypothesis. The decline in liquidity and the credit rationing provides an incentive for firms to use EM so as to either attract funds or maintain their debt covenants at the current level thus avoid further restrictions. The adverse selection at this time makes EM an option. Therefore firms can use either AEM or REM depending on their characteristics such as size or debt levels. This provides a background for the development of the hypothesis.

The first hypothesis anticipates that firms will use either AEM or REM depending on which method has the best benefits for them. Even though previous studies on the financial crisis have shown a decline in AEM. I anticipate that this may still be applicable for certain firms but others will use REM. Badertscher (2011) as already discussed observes that there is a pecking order in the use of EM tools. Thus firms will use AEM to achieve over-valuation and then when this becomes inhibited they will use REM to maintain the valuation even though there are long- term negative consequences of using this method. I therefore expect that one way or another there will be a motivation for firms to use EM during the financial crisis period, hence if AEM is restricted they will use REM. One reason for maintaining that AEM would be used is that firms may have been caught by surprise by the financial crisis and would not have enough time to institute REM measures as this would need time to produce the desired result. Therefore at the end of the financial year when firms are keen to augment performance and it is at the financial reporting period then manipulating the financial statements through discretionary accruals would be a plausible avenue. They would subsequently use REM if the AEM methods are not effective as the financial crisis continues to unfold. I therefore investigate both EM methods for the sampled firms.

The hypothesis that develops from this is that.

H1: UK-listed firms engaged in either income-increasing accrual-based earnings management or income-increasing real earnings management in response to the financial crisis.

It may be anticipated that medium-sized firms (FTSE 250) would have greater incentives to manipulate their financials as they have better prospects for growth as compared to small (FTSE Small Cap) and large firms (FTSE 100). They are therefore keen to attract investment that would support their development to the next level. Large firms (FTSE 100) would have quite sizeable assets that can be used as collateral to obtain funding. Additionally, they would have superior access to the capital markets and banking facilities thus less of an incentive to use EM. They also have more sophisticated investors who would discern this manipulation and even reprimand the use of EM. On the other hand, as documented, small firms (FTSE Small Cap) already faced restrictions on new lending and had to rely on drawing down on their existing credit lines. They already have limited financing options thus EM would have less of an attraction. They also have less market share thus REM would not be a desirable option.

From several of the previous literature, small firms drew down heavily on their credit lines (Campello et al 2010). Block et al (2010) also find a decline in funding during the financial crisis by a venture capitalist who normally invests firms in their initial or early phases as they develop. The reason being that during the financial crisis period, they find these firms to be risky investments. Other studies argue that firms with significant institutional or corporate ownership such as large firms have investors more capable of teasing out the financial statements to establish EM however other papers find that investors are still incapable of finding out if a firm used EM. Even though previous literature put forward this argument, I investigate firms based on three different sizes that are FTSE 100, FTSE 250, and FTSE Small Cap to verify this claim. There would still be an argument for large firms that is FTSE 100 to use AEM or REM to show that they have weathered the financial crisis storm much better than their peers. The same could be argued for medium-sized and small firms.

The hypothesis that follows is.

H2: Firms of varying sizes have a dissimilar use of AEM and REM during the financial crisis period.

As already outlined, the 2007/2008 global financial crisis was a period of deep declining liquidity with financial institutions such as banks being conservative in their lending while mechanisms for investment such as commercial papers experiencing a significant decline. I therefore hypothesize that it is likely that constrained firms such as those with higher levels of debt would have greater incentives to manipulate their financials as they would face greater restrictions on their debt covenants as compared to firms with less debt. For firms with significant levels of debt, I use certain parameters such as interest cover to determine the firms' debt levels. Companies with comparably lower levels of interest cover imply that their profits have lower wiggle room when it comes to servicing their debt and vice versa.

Some studies such as Defond and Jiambalvo (1994) find that highly leveraged firms use income-increasing accruals to manage earnings and meet debt covenants. Others also agree that such firms use AEM. However this would pose certain questions, for example, it would be expected that financiers or sophisticated investors such as the banks and financial markets would be aware of this and would have mechanisms to investigate it or even penalize such practices. Would this then provide room for firms to use REM which would be within the management's purview and is also less likely to be detected? It would be expected that REM would likewise provide an alternative option. One thing that would be anticipated is that one way or another firms with financial constraints from a debt or working capital point of view may use EM as a tool to prop up their financial performance hence avoiding restrictions from their lenders. An alternative view would be that the firms with financial constraints would use the pecking order of EM as claimed by Badertcher (2011) in that they will employ AEM to augment performance then when this becomes untenable they would then use REM to maintain the improved numbers. I analyze the data from these perspectives as I anticipate that both AEM and REM would be the methods of choice depending on the firm's characteristics.

I, therefore, seek to investigate both methods to provide evidence of firstly whether these firms use EM and which method is more suitable as both methods would be plausible depending on either side of the argument. The hypothesis that follows is.

H3: UK-listed firms that are constrained financially engaged in either income-increasing AEM or REM in response to the financial crisis.

AEM involves the manipulation of financial statements by use of the discretionary accruals it will be guided by the space or room that firms have in influencing these figures. On the other hand REM through deviating from normal operations will be restricted or enhanced by the company's fundamental financial and economic strengths that can inhibit or expand its operations. Several factors will determine whether a firm will use AEM or REM and the levels at which this can be used. These include its operating cycle, net operating assets, tax rate and risk of bankruptcy. These variables determine the freedom afforded to firms to use either one of these EM methods.

I include these variables to provide greater information on the firm characteristics. For AEM I use the operating flexibility that is net operating assets and operating cycle as AEM variables. For example, I anticipate that firms with longer operating cycles will have greater flexibility to use AEM as they have more time to reverse accruals as opposed to those with less operating cycle days. For REM I use the risk of bankruptcy and marginal tax rate as REM variables. I expect that for example firms with lower risk of bankruptcy will have more room to amend their operations if needed so as to improve performance. I also run the same variables on both sides such as the risk of bankruptcy on AEM and operating cycles on REM to observe the effects that they have, this is due to the fact that there is an anticipation of AEM and REM being substitutes hence this would be of interest for this study. I therefore ran a regression that includes AEM and REM with their respective variables

As outlined in previous studies, the firm's characteristics is a plausible determinant on whether they will use AEM or REM. Other papers such as Cohen et al (2008), Zang (2012), and Badertscher

(2011) find that the AEM and REM variables have an impact on the ability of firms to use either of these EM methods. I investigate these characteristics as well during the financial crisis and predict that this will still be applicable. I anticipate that firms will use either of these EM methods depending on their characteristics.

The hypothesis that follows from this is.

H4: UK-listed firms' characteristics affect the ability of firms to use income-increasing accrual-based earnings management and real earnings management in response to the financial crisis.

3.3 SAMPLE AND DATA

This study will be conducted on public companies that seek financing from the developed and established capital markets with noteworthy access to global markets and funds thus negatively impacted by the financial crisis elements such as flight to safety, they would also be followed by analysts and the general market for trading or investment. For this, I have chosen the London Stock Exchange FTSE All share which represents 98% to 99% of the entire market capitalization. The FTSE all share consists of the FTSE 100, FTSE 250, and FTSE Small Cap. The FTSE 100 is made up of the largest 100 firms by market capitalization and represents 80% of the market capitalization. The FTSE 250 is the next largest 250 firms by market capitalization and finally FTSE small cap. For FTSE 100 this will be companies with a market capitalization of above £3bn, the FTSE 250 above £700million, and FTSE small cap for the rest. To avoid survivorship bias this paper will retain a company in an index even if it drops to a lower index but maintains a steady market capitalization, this is due to the pricing pressures hypothesis. Bernhardt et al (2005) find that for the UK, the price for shares is dependent on the relationship between dealers as well as the size of orders. They note that the price improvements rise with the value of the relationship consequently they state that the ''better the relationship the more price improvement on an order of any particular size''. Moreover, the large orders are given worse prices. The relationship between these two therefore is that brokers who provide dealers more business would have a healthier relationship, subsequently, they would offer larger orders so at to benefit from improved prices. These results are specific to the London Stock Exchange as the dynamics for transactions on the trading floor between the dealers and brokers and the timing of competition of orders are different to the New York Stock Exchange and Paris-Bourse processes.

Bernhardt et al (2005) impact on this research design is that I maintain firms in their respective index even if their market capitalization drops slightly as this could be due to other factors and not necessarily their underlying financial performance or market dynamics, it enables the study to mitigate against the effects of survivorship bias. Even though the FTSE 100 comprises Circa 80% of the market capitalization the study is conducted on the other individual respective indices for comparison so as to avoid the assumption that the characteristics for EM for FTSE 100 can be generalized to be for the entire stock market. This also enables the research to provide empirical evidence on EM amongst firms of various sizes and if there is evidence that certain firms be they large, medium, or small-sized have a different use of the EM methods. Companies will have various incentives to manage their earnings during the financial crisis period for example small

and medium-sized companies are at the growth stage thus investors are keen for them to develop to the next level. I use the calendar year-end market capitalization and compare this to the financial year-end as well. This information is available from the London Stock Exchange.

This research will analyze the firms in these three distinct groups to provide evidence based on the size between large multinationals to medium-sized firms and those much smaller. Financial statement data has been obtained from Datastream financial software by Thomson Reuters thus a reliable platform as it is also widely used by financial analysts and the academic community. The Datastream software is accessible from Durham University library on and off-site, this also makes it a convenient software and a quite pragmatic database given that the just past pandemic resulted in travel restrictions and made working from home the new normal. The other software of choice would have been Bloomberg however the costs of purchasing a terminal is prohibitive plus the off-site installation and training was not possible at that time. The study intends to investigate EM during the financial crisis period, the analysis involves an empirical examination of the data before, during and after the financial crisis with the comparison of the nature of EM between these times. The data collection also follows the theoretical framework foundation which is based on economic and agency theory. Economic theories are empirically examined either through primary or secondary data collection. Primary data collection involves interviews, questionnaires or other documented records. Secondary data collection is obtained from already published sources such as newspapers, books or news. The difference between the two is that primary data collection is first-hand collection by the researcher while secondary data is obtained thereafter from someone else's primary data. Primary data is therefore preferred dependable as unadulterated and clean. This paper follows this process. I therefore use primary data which is used in economic and agency theory research as a reliable data collection method, the financial data is obtained from Datastream and the data is analyzed through SPSS.

Ekelund and Herbet (2013) note that economic theory is considered to be under social sciences. Social sciences can use either qualitative or quantitative methods. Prior literature such as Goodwin and Goodwin (1984) and Lynch (1984) note that the distinction between qualitative and quantitative data collection is somewhat artificial. Whereas there are debates on these forms of data collection what needs to be emphasized is that their fundamental underpinning is that they are methods of data collection. Goodwin and Goodwin (1984) state that ''the choice of research procedure- including design, sampling plan, instrumentation, data collection method, and data analysis techniques- should match the research question and be optimally efficient, powerful, valid and reliable. Olalere (2011) also provides a further discussion on the same by stating that the attention of accounting research is to either develop new theories or on the other hand to update the existing ones. The primary standard to which this is held to is its validity and its quality. This is the evaluation test of accounting research. Saunders et al (2012) provide an argument for the use of quantitative data by explaining that this approach is helpful in studies of descriptive research that require a researcher to test the accepted ideas and therefore reach a dependable conclusion on events that occurred. Another reasons for using quantitative research is that it is also widely used in statistical techniques by other accounting Journals. Gruszczynski, (2009) also finds that quantitative research is mostly used in contemporary accounting research and journals such as the European Accounting Review and the Journal of Accounting Research. Another reason is that it

is a strong method for research for hypothesis testing by using data without speaking to market participants (Olalere, 2011) and finally is that this method is closely linked to the positivist school of thought and deductive hypothesis (Saunders et al (2012) This quantitative approach fits well the description of this thesis that seeks to investigate the EM methods during the financial crisis while being based on testing the agency and economic frameworks during this time and relation to positivism philosophy and deductive hypothesis.

This thesis also uses primary data. Fienberg (1994) and King (2006) both observe that the use of secondary data can be of use for undergraduate and graduate students. One of the reasons for this is that these courses are short and therefore it is not feasible for them (students) to be able to obtain and analyze the data on a large scale in a semester-long session. However, this form of data set provides the students a chance to have experience of science and for teachers to guide students. However for projects such as this doctorate then there are benefits for using primary data. Firstly King et al (1995) find that researchers who perform studies based on articles or available data are cited more often than those with no data. They state that those with ‘’no data but otherwise equivalent credentials, including a degree of formalization’’ are less cited. Secondly, the use of primary data enables the researcher to perform a scientific process that is constructed on previous work (Bailar et al 2012; Louis et al 2002). Finally, large data sets can be of benefit for the public if used in the best possible way (Bailar et al 2012). This thesis fits these three descriptions in that it seeks to be used widely is of interest amongst various fields such as accounting, economics and other social sciences. Therefore the use of primary data is important to be understood by a cross-section of academia and private organizations who are conversant and interested in this type of data. Secondly, this thesis builds on other theoretical frameworks that is agency and economic theory while using the accounting formulas and methods already established hence this form of data is useful to build on these areas. The thesis also seeks to assist the public such as regulators and government in understanding the use of EM during the financial crisis.

The data will be combined for the financial years of interest that is 2004 to 2018. The periods 2007 to 2008 denote the time when there is a severe economic downturn. I first ran a regression for each year. I then also ran a second regression for the combined time periods that is 2004 to 2018. This will be in the form of a time trend where I separate the positive and negative residuals then I ran these against time which is the difference between the financial year and the original year 2004 and the second variable is the financial crisis period for which I use 0 for the years 2004 to 2006 and 2009 to 2018 and one for the financial crisis period that is 2007 to 2008. I shall exclude firms that are delisted or taken private during the period of the study. This is to avoid an analysis of firms that do not have sufficient information or whose information may only be available for a few years. I also include the other variables in the regressions for both AEM and REM. I do this for least squares and two-stage least squares.

3.4 EARNINGS MANAGEMENT FORMULAE

The analysis entails a least squares and two-stage regression analysis, firstly the data is examined using several AEM and REM formulas. For AEM I use the Jones and Modified Jones models with Kothari model for robustness checks while for REM I use the abnormal production costs, abnormal

cash flows, and abnormal discretionary expenses models. The movement of the sign of the residual provides an indication as to levels of the discretionary accruals and abnormal operation levels whether there is an augmentation or decline in EM of the sampled firms. The sign provides evidence of increased or decreased incomes. Then secondly I ran a multiple-time trend regression for the combined 2004 to 2018 data of the positive and negative residuals with time and the financial crisis period as the two variables as well as including the other variables. These AEM and REM formulas have wide acceptance in the accounting and academic community and have been used numerously in previous papers investigating EM such as Bhojraj et al (2009), Badertscher (2011), Burnet et al (2012), Zang (2012), Cohen et al (2008) and Gunny (2005). The AEM formulae that is the Jones and Modified Jones model involve computing the discretionary accruals while the REM formulas for Roychowdhury (2006) consist of calculating the abnormal levels of production costs, discretionary expenses or cash flows. By investigating the discretionary accruals and abnormal operational levels this paper just like other studies on EM provides evidence on whether these two metrics are outside the normal range or are beyond the accepted limits thus the financial statements include manipulated numbers.

For AEM, the Jones (1991) formula is given by

$$\frac{\mathbf{TACC}_{j,t}}{A_{j,t-1}} = \boldsymbol{\lambda_1}\left(\frac{1}{(A_{j,t-1})}\right) + \boldsymbol{\lambda_2}\left(\frac{\triangle \mathbf{S}_{j,t}}{A_{j,t-1}}\right) + \boldsymbol{\lambda_3}\left(\frac{\mathbf{PPE}_{j,t}}{A_{j,t-1}}\right) + \boldsymbol{\varepsilon_{j,t}} \text{---------- (1)}$$

Where TACC is total accruals which is the sum of the discretionary and non-discretionary accruals, ΔS is the change in revenues from last year to this year, PPE is the book value of property plant and equipment, ε is the discretionary accrual and this is the number I will be solving for. In this formula, positive (negative) discretionary accruals is increasing (decreasing) incomes. I also separate the firms that have positive or negative accruals and investigate them separately to analyze if they have specific characteristics that may be of interest. Additionally, I investigate the firms' EM by use of the modified Jones model. The difference between the two that is the Jones and the modified Jones model is that the latter takes into account credit sales (ΔS- ΔREC) by deducting the year-end receivables from the revenue. The reason for this is that the sales at the end of the period may have been derived from EM activities such as extending credit terms or provision of excessive sales discount or these could have been earned in the subsequent financial year but booked in the preceding year. Therefore to avoid a distortion of the financial statements due to misstated sales the modified Jones model expunges these from the formula.

$$\frac{\mathbf{TACC}_{j,t}}{A_{j,t-1}} = \boldsymbol{\lambda_1}\left(\frac{1}{(A_{j,t-1})}\right) + \boldsymbol{\lambda_2}\left(\frac{\triangle \mathbf{S}_{j,t} - \triangle \mathbf{REC}_{j,t}}{A_{j,t-1}}\right) + \boldsymbol{\lambda_3}\left(\frac{\mathbf{PPE}_{j,t}}{A_{j,t-1}}\right) + \boldsymbol{\varepsilon_{j,t}} \text{---------- (2)}$$

As already elucidated in the literature review, McNichols and Wilson (1988) note that most papers use either a ''portfolio'' approach in that they sum the discretionary accruals. They assert that there is a risk of observing AEM even when this is not present. This form of EM may have been influenced by other economic and performance factors. McNichols (2000) observes Jones (1991)

model which focuses on aggregate accruals is the most commonly used method by researchers when investigating AEM. She also finds that the Jones model is slightly weaker than for the modified Jones model after controlling for earnings performance. She (McNichols, 2000) observes that the reliance on discretion accruals is one of the limitations of AEM. She suggests that for future research there is a strong argument for departure from the accruals approach. For robustness, I also use the Kothari model and McNichols (2002).

Kothari model uses the modified Jones model however it includes an additional component of return on assets. The formula includes the element of performance matching discretionary accruals. The inclusion of the return of assets incorporates the performance matching along with the discretionary accruals and enhances the strength and quality of the examination of AEM for the sampled firms. This formula is shown below.

$$\frac{\mathbf{TACC}_{j,t}}{A_{j,t-1}} = \lambda_1\left(\frac{1}{(A_{j,t-1})}\right) + \lambda_2\left(\frac{\triangle \mathbf{S}_{j,t} - \triangle \mathbf{REC}_{j,t}}{A_{j,t-1}}\right) + \lambda_3\left(\frac{\mathbf{PPE}_{j,t}}{A_{j,t-1}}\right) + \lambda_4\left(\frac{\mathbf{ROA}_{j,t-1}}{A_{j,t-1}}\right) + \varepsilon_{j,t} \text{---------- (3)}$$

McNichols (2002) uses a cross-sectional model to estimate the discretionary accruals. In this method, she combines the Jones (1991) model and the Dechow and Dichev (2002) method. This also enables us to examine the explanatory power of cash flows for accruals after controlling for the change in sales and property, plant, and equipment. Given the decline in liquidity and focus on cash flows during this financial crisis period, this method also provides us with an expansive understanding of AEM at this time. This formula is shown below

$$\frac{\mathbf{TACC}_{j,t}}{A_{j,t-1}} = \lambda_1\left(\frac{1}{(A_{j,t-1})}\right) + \lambda_2\left(\frac{\mathbf{CFO}_{j,t-1}}{(A_{j,t-1})}\right) + \lambda_3\left(\frac{\mathbf{CFO}_{j,t}}{(A_{j,t-1})}\right) + \lambda_4\left(\frac{\mathbf{CFO}_{j,t+1}}{(A_{j,t-1})}\right) + \lambda_5\left(\frac{\triangle \mathbf{S}_{j,t}}{A_{j,t-1}}\right) + \lambda_6\left(\frac{\mathbf{PPE}_{j,t}}{A_{j,t-1}}\right) + \varepsilon_{j,t} \text{---- (4)}$$

For REM I use Roychowdhury (2006) formula that analyses the abnormal levels of production costs, cash flows and discretionary expenses. The three formulas measure the extent of the deviation of the firm from its normal level of activity. The sign of the residual for the respective formulas that is positive or negative provides an indication of increased or decreased income manipulation. For abnormal production costs, the formula used is.

$$\frac{\mathbf{PROD}_{j,t}}{A_{j,t-1}} = \left(\frac{\alpha_0}{A_{j,t-1}}\right) + \alpha_1\left(\frac{S_{j,t}}{A_{j,t-1}}\right) + \alpha_2\left(\frac{\triangle S_{j,t}}{A_{j,t-1}}\right) + \alpha_3\left(\frac{\triangle S_{j,t-1}}{A_{j,t-1}}\right) + \varepsilon_{j,t} \text{---- (5)}$$

Where PROD=cost of goods sold + change in inventory; S=sales revenue: A=total assets. Abnormal production cost is the residual value at year t for the firm, where positive abnormal production costs represent increased REM and vice versa for the negative residual. For Abnormal Cash Flows, the formula to be used is

$$\frac{\mathbf{CFO}_{j,t}}{A_{j,t-1}} = \frac{\alpha_0}{A_{j,t-1}} + \alpha_1\left(\frac{S_{j,t}}{A_{j,t-1}}\right) + \alpha_2\left(\frac{\triangle Sj_{,t}}{A_{j,t-1}}\right) + \varepsilon_{j,t} \text{ ---------- (6)}$$

CFO=cash flow from operations: S=sales revenue: A=total assets. Abnormal cash flows is the residual value at year t for the firm. Where negative abnormal CFO represents increased REM and vice versa for the positive residual. For abnormal discretionary expense, the formula to be used is

$$\frac{\mathbf{DISEXP}_{j,t}}{A_{j,t-1}} = \frac{\alpha_0}{A_{j,t-1}} + \alpha_1\left(\frac{S_{j,t}}{A_{j,t-1}}\right) + \alpha_2\left(\frac{\triangle S_{j,t-1}}{A_{j,t-1}}\right) + \varepsilon_{j,t} \quad \text{---------- (7)}$$

DISexp=advertising expenses+ R&D expense+ SG&A expense[18]; S=sales revenue; A=total assets. Abnormal discretionary expenses of firm at year t is the residual value. Negative abnormal discretionary expense represents increased REM and vice versa for the positive residual.

3.5 VARIABLES

I will hereafter discuss in greater detail in this section the methods that I use to establish the various variables such as operating cycle, net operating assets, risk of bankruptcy, and tax. I have also used other general variables which I outline in this segment. These variables include the change in the gross domestic product and return on equity which will have an impact on the use of AEM and REM and thus would be important for this paper and would improve the quality of the results as well as provide a deeper and broader understanding of the macro-economic and corporate structures that would be of relevance. I also examine how financial constraints may have an effect on the FTSE All share firm's constituent indices and if the firm's elevated debt levels related to these financial limitations may have increased EM activities as compared to their peers. I envisage that firms with financial constraints would have a strong motivation for engaging in EM during the financial crisis.

As already discussed, the global financial crisis was a period that experienced deepened declining liquidity with governments intervening to assist distressed banks thus enabling them to resume lending which certain studies have found did not materialize. Alternatively, financial institutions still restricted credit to their clients with others tightening debt covenants. I anticipate that firms with disproportionate debt levels would have an incentive to manage earnings so as to avoid restrictions on their debt covenants. These firms would seek to show that they are still strong and performing well during the financial crisis period thus there is no need for financial institutions to amend their debt agreements or institute restrictions such as engaging in further borrowing, restricting the type of investment activities that they can undertake or even curbing the extent to which the company can undertake mergers and acquisitions. The debt covenants can also be used as a tool to conserve cash and maintain the firm's stable liquidity levels. An example of this would be a restriction on the level of payouts or inhibiting the firms' disbursement activity with a view to maintain or conserve its cash flow. This would entail limiting large payouts or cash outflows to settle debts so as to avoid a negative impact on a firm's liquidity position. On the other hand, the lenders would have a keen interest in the firm's financial statements and would be qualified professionals who are able to tease out EM. Thus I investigate both EM methods in case firms with high debt levels segue to REM due to the difficulty in detecting it and because it would naturally be under the management's purview.

[18] *R&D stands for research and development while SG&A represents selling, general and administrative expenses.*

I use the interest cover ratio to determine firms that are facing the impending danger of breaching their debt covenants. Firms with higher (lower) interest cover are considered to be far (close) to their debt violation covenants. The interest cover enables us to determine how easily or without difficulty a firm will be able to settle its debt. The ratio of the debt to its profitability gives a picture of how a company can pay the interest on its debt without any problem. The ratio is of interest to external parties such as lenders or creditors in assessing the risk of lending to a firm. They are keen to establish that the firm has sufficient earnings to cover the interest payments without any challenges and thus they have enough headroom for the future and to take care of any unplanned or unforeseen financial shocks. I compute the interest cover for firms with negative and positive AEM and REM residuals and compare the same. I will also use working capital ratios to establish firms that have liquidity constraints thus would be in need of lending either in the form of interim financing or for working capital injection. Working capital enables us to determine the amount of cash that a firm has for its day-to-day operations, it also aids in understanding whether there is a potential for a firm to experience future liquidity problems.

A company with working capital constraints could lead to lenders or banks requesting the firm to institute measures such as strict deadlines to meet their obligations, introduce restrictions on the levels of fixed and variable costs or they may monitor the firm's payments while at the same time request management to combine this with strong accounts receivable monitoring. Firms will therefore be keen to avoid such actions from their lenders. EM provides a tool to improve performance. Consequently, I use working capital ratios such as the level of current assets to current liabilities and analyze firms with weak/strong ratios vis-a-vis the positive and negative AEM and REM residuals. I expect these to have stronger incentives to manage their earnings. However, it is also important to note that there are inherent limitations in the use of the working capital formulas in that firstly there may be a high level of inventory in current assets that would not necessarily be convertible to cash and secondly there may be augmented debtors due to end year sales incentives such as extending the credit limits which would increase the current assets. I therefore use the working capital formulas with this in mind as these could impair the results. I additionally include the quick ratio which deducts the inventory from current assets.

I subsequently analyze the effects of the AEM variables on the data. I examine the operating flexibility of the firms as AEM variables, these are net operating assets and operating cycle. The operating flexibility provides us with information of the level of financial elasticity that the firm has. For example, the operating cycle enables us to understand the days that the firm has to obtain inventory then sell the same and obtain cash. Net operating assets level enables us to monitor the level of the firm's operating assets such as cash, inventory, or accounts receivables versus its operating liabilities such as accounts payable. The formula involves the sum of total debt and common equity less cash and short-term investments which is different to working capital where I use the ratio of current assets to current liabilities. For net operating assets, the variable is used as a control variable. I use this in the second stage of the regression after separating the positive and negative residuals. I include this in the second multiple regression for the time trend analysis for the three indices. A firm would be considered to be facing liquidity difficulties if its operating liabilities are greater than its operating assets. The operating cycle is calculated using Dechow (1994) method which is receivable days plus inventory days less payable days. These variables

enable us to determine the restriction of flexibility within the firms thus impacting the ability of managers to manipulate accruals. For example, a longer operating cycle provides greater flexibility for management to reverse accruals. These factors will determine whether a firm will use AEM or if restricted then they will segue to REM. I also compare the net operating assets and operating cycles for firms with negative and positive residuals to examine if there is a dichotomy.

For REM, I use the risk of bankruptcy. I also include other variables for further analysis such as tax rate. These provide us with a fuller picture of the use of REM vis-à-vis specific firm characteristics thus improving the sturdiness of the results. I have also included them in the hypothesis as they are of interest in enabling us to have a much broader understanding of the use of REM during the financial crisis and how a firm's specific characteristics affect the use of the three REM methods. For the risk of bankruptcy, I use the Altman Z-score index which provides a proxy for the firm's financial health. Admittedly the formula is from the US there are modified or calibrated techniques for the same that would be appropriate for the UK. One of the problems of using this method in the UK is that it would not necessarily provide the accurate time for bankruptcy to occur. Nevertheless, the US model is still widely used by UK corporate analysts and financiers to determine the level of bankruptcy for UK firms. I therefore use the same approach while being cognizant of the inherent limitation that this may have for UK firms. It is worth pointing out that the Altman paper that developed this method used the US public manufacturing firms. This is given as.

$$\boldsymbol{Z - score = 1.2\,(A) + 1.4\,(B) + 3.3\,(C) + 0.6\,(D) + 1.0\,(E)}$$

Where:

A =Working Capital (Current Assets – Current Liabilities) / Total Assets)
B= Retained Earnings / Total Assets
C= Earnings Before Interest & Taxes (EBIT) / Total Assets
D= Market Value of Equity (Mkt. Cap. + Preferred Stock) / Total Liabilities
E= Sales / Total Assets
Z-Score Results:
Z-Score of < 1.81 represents a company in distress.
Z-Score between 1.81 and 2.99 represents near distress.
Z-Score of over 3.0 represents a safe firm.

I also use the tax rates formula which is the ratio of the income taxes to pre-tax income and relate this to the level of the three REM components. REM would increase the tax exposure thus shareholders who have a more sophisticated understanding and would be able to notice and question why the firm is paying a greater tax than anticipated would be opposed to its use if the increase in taxes is not commensurate to the augmented distributable profits and dividends. Therefore the difference between the actual tax paid and what would be expected to have been paid through strategic tax planning would also be of interest to managers. Deegan and Hallam (1991) find that certain investors are keen on the firm's tax policies and disclosures on the same. This has meant that companies have to include tax reporting schemes and disclose this information for compliance purposes. I relate the tax rate to the absolute REM residual to provide an empirical

analysis of the same. I compute the tax rate by dividing the income tax by the earnings before taxes. I also compare the tax rates for the positive and negative residuals to evaluate the differences.

I shall also discuss corporate governance as variables and previous results. For corporate governance variables, I shall use previous papers on the quality of the auditors, whether the CEO is also the Chairman of the board, board independence, and institutional ownership. Evidence of the quality of auditors on EM is mixed. Cohen and Zarowin (2010) and Chi et al (2011) find that Big N auditors are positively related to REM whereas Zang (2012) does not establish a positive relation. Nevertheless, most prior research observes that high-quality auditors have a negative impact on discretionary accruals. These include DeAngelo (1986), Teoh and Wong (1993), and Francis et al (1999). I therefore include previous studies' results which would provide robust results on the impact of corporate governance on EM. The separation of whether the CEO is also the Chairman of the board is an important variable for corporate governance and board independence. Efendi et al (2007) find that EM is positively related to whether the CEO is also the chairman of the board. Board independence is also an important element in evaluating the effect of corporate governance on EM, this is determined by the percentage of independent directors on the board. Extant research shows that independent directors have an influence on board decisions (Weisbach, 1988; Byrd and Hickman, 1992). Other studies find that they are capable of identifying and restraining EM practices (Dechow et al 1995; Peasnell, et al 2005).

Another important corporate governance variable as discussed in other papers is on institutional ownership. The active monitoring theory opines that institutional investors advance a substantial amount of funds, they therefore tend to be more active participants in order to safeguard their investments. Velury and Jenkins (2006) note that there is a positive association between institutional investors and earnings quality. Bushee (1998) also finds that firms with higher levels of institutional than individual ownership are less likely to manage earnings because institutional owners have better tools that enable them to interpret financial information[19]. I also include general variables and compute their result in the linear regressions. Badertscher (2011) notes that prior studies find these variables to be important determinants in a firms' EM activities. These variables include the control for the firm's return on equity, which is computed by dividing the net income by the shareholder's equity. Another variable is the change in the gross domestic product. (GDP). Cohen et al (2008) observe that ''what might be classified as opportunistic earnings management may in fact be a consequence of a change of changing economic conditions''. In this case the discretionary accruals may be a mirror of a company's response to and representation of altered economic conditions.

The results will enable the development of a model that is characteristic of a firm that engages in EM during the financial crisis. As already stated I also use the time period in the time series regression. Other studies such as Badertscher (2011) use time as a general variable however Cohen et al (2008) include this in the time series regression, I follow this approach. Whereas both papers

[19] Active monitoring theory is explanatory on participating individual or agency duties to improve corporate governance and strengthen the result of the quality of annual financial statements that is profit and loss, balance sheet, and statement of changes in equity.

use regressions of AEM and REM, they have some differences. For example, Badertscher (2011) includes firms with more egregious EM that is outside of GAAP as a third form of EM. Secondly, Badertscher (2011) includes overvaluation as an indicator variable with 1 for firms in the top quantile and 0 for the rest while Cohen et al (2008) separate firms between pre and post-Sarbane Oxley Act analogous to this paper where I use the pre and post-financial crisis period. I use the dummy variable for this with one for the financial crisis period and zero otherwise and also use the difference between the financial statement year and the initial year of analysis that is 2004 as the time variable. I shall then use these two variables that is time and financial crisis period in the time series regression to establish the significance of time and financial crisis period for the FTSE all share respective indices for both AEM and REM methods. I ran the multiple regression for the entire sample period that is 2004 to 2018 that includes the specific AEM and REM variables plus the general variables and financial ratios for the yearly positive and negative residuals. Combining the variables in the multiple regression enables us to view the total sum of the results rather than run separate regressions. The inclusion of the control variables and both EM's in the multiple regression is the same process as is used for Cohen et al (2008) and Badertscher (2011). I also include a two-stage series regression for the test of endogeneity which I also employ. This is discussed later in this thesis and in relation as to how the process relates to the Badertscher (2011) research. The comprehensive table of variables can be shown as below.

Table 1**: Table of variables for AEM**

Variables			
Dependent variables	Dummy variable	Control variables	Independent variables
• Accrual earnings management	• Time • Financial crisis	• Change in GDP • Return on equity • Net operating assets • Operating cycles • Debt ratio • Debt to EBITDA • Debt to equity • Quick Ratio • Times Interest Earned • Working Capital	• Real earnings management

Table 2: Table of Variables for REM

Variables			
Dependent variables	Dummy variable	Control variables	Independent variables
• Real earnings management	• Time • Financial crisis	• Change in GDP • Return on equity • Tax Rates • Risk of Bankruptcy • Debt ratio • Debt to EBITDA • Debt to equity • Quick Ratio • Times Interest Earned • Working Capital	• Accrual earnings management

3.6 DESCRIPTIVE AND INFERENTIAL STATISTICS

I include a general analysis of the data to provide an overview of the numbers. These descriptive statistics will be of benefit to analyze the sampled data. Subsequently as already outlined I shall provide a deeper analysis of the data through an inferential statistics examination. The statistics will be of benefit to analyzing the sampled data. Subsequently as already outlined I shall provide a deeper analysis of the data through an inferential statistics examination. The descriptive statistics which include the mean, mode, median, and standard deviation shall be undertaken in a stepwise manner. For example, the mean of the data such as the average number of firms in a given year that engaged in EM within the specific index enables us to have an initial understanding of whether there were more firms that had positive discretionary accruals or for REM positive abnormal production costs or negative abnormal cash flows and discretionary expenses for increased REM. The preliminary evaluation assists us to obtain an initial impression of whether there were more or less firms that engaged in EM during the years of the study and consequently in the financial crisis period. These results are then compared with previous papers for evaluation as to whether they are in line or if they deviate with the expectation. Thereafter I undertake a much deeper examination of the results that will provide the fuller picture. For example, I separate the firms that

have either positive or negative discretionary accruals and analyze the REM components for these firms to evaluate if they may have replaced AEM for REM. I also use a time series regression for the firms with positive and negative residuals over the period of the study that is 2004 to 2018 to establish the significance and the trends that relate to time and the financial crisis period for both AEM and REM.

Other descriptive statistics examples include computing the mean or median of the various operating cycles. This enables us to understand the average length of time that the firms in the respective index can sell their products thus turning inventory into cash. The anticipation is that companies with longer operating cycle will have greater room to engage in AEM. I also compute descriptive statistics such as mean, median, and standard deviation for other metrics such as working capital and interest cover that enable us have an understanding of the sampled firms and their financial constraints level. I also compute descriptive statistics for other numbers of interests such as sales, total assets, and total accruals. In essence, the descriptive statistics will enable us to have a general feel of the data and a broad understanding of the financial structures of the London Stock Exchange firms that are of interest to this paper. The descriptive statistics provide us with an understanding of the quantitative features of the data, this enables us thereafter to carry out much further analysis on other related analytical metrics that would be of interest and beneficial in providing a much deeper understanding of the study. Furthermore, descriptive statistics allows us to organize, analyze and summarize the data and therefore provide a first-order relationship of our interested results before proceeding to the regressions. I also compare this to previous studies and check whether the results are consistent and in line with anticipated results. For example, I compute the absolute values for the period 2004 to 2018 for both AEM and REM and compare to Cohen et al (2008) descriptive results. This will then be followed by a much deeper inferential statistics that provide specific empirical evidence of the relationship as it pertains to the sample.

For the inferential statistics, the analysis shall involve a study of the hypothesis which entails carrying out the regressions for the respective EM formulae with the inclusion of the financial constraints quotients, firm characteristics elements, and the appropriate variables. I will seek to investigate the estimating formulas below

$AEM_{i,j}$ =f (REM, time, financial crisis, instruments for AEM, controls);

$REM_{i,j}$ = f (AEM, time, financial crisis, instruments for REM, controls);

In this equation, the AEM is the discretionary accruals which are either positive or negative residuals. REM; three REM methods that is abnormal production costs, abnormal cash flows, and abnormal discretionary expenses, these are either the positive or negative residuals. Time and financial crisis as already discussed are the dummy variables that is for time is the difference between the year of the period and 2004 while financial crisis is 1 for 2007 and 2008 and 0 for the other years. Instruments for AEM and REM are the specific characteristics for the two EM methods that are operating cycle and net operating assets for AEM and risk of bankruptcy and tax rates for REM and finally controls are the constraint quotients such as interest cover, working capital, Debt to Equity, Debt to earnings before interest, tax, and depreciation (EBITDA) amongst the other financial ratios.

As already discussed, this paper will involve the examination of both AEM and REM to investigate which method would be used during the financial crisis period. The over-arching anticipation is that firms will use EM during the financial crisis however we are not clear in which direction this will entail it could be either AEM or REM. The inferential statistics will therefore involve a two-tailed test approach to evaluate both AEM and REM during the entire period that is 2004 to 2018 and a further analysis of the financial crisis years through the same time series regression analysis. I will undertake yearly regressions of the data for the individual index as well and thereafter separate the positive and negative residuals to compare the movements. As already outlined I subsequently undertake a second time trend regression. The least squares regression analysis enables us to obtain our estimated coefficient to determine whether this is positive or negative and if it is increasing or decreasing. The same is done for two-staged least squares. The results in the movement of the EM proxies shall allow us to determine whether there is an increase or decrease for AEM or REM that is the discretionary accruals, abnormal production costs, abnormal cash flows, or abnormal discretionary expenses.

One reason for attempting to undertake the two-staged least squares approach to compare the results in that it enables us to shield the results from endogeneity and at the same time avoid biasness and inconsistencies on our parameters. Badertscher (2011) notes that the presence of endogeneity ‘’could cloud the interpretation of results’’. The problem of endogeneity whereby the error term is correlated to the explanatory variable is one that is of interest in research more so if the study is of a non-experimental nature. The two-step least squares process has the added benefit in that we can use the first stage of the regression to obtain the EM residuals or the problematic predictor which is the positive or negative sign that indicates the AEM or REM movement. The second stage of the least squares regression will involve a time series examination to investigate firstly whether there is a trend in the movement in the EM residuals thus AEM or REM behavior over the period and secondly, whether there is a significant relationship between the EM residuals and the financial crisis period which is a central theme of this paper. This also involves the inclusion of the other variables. These variables are run as instrumental variables on SPSS. I perform the second stage of the regression in the form of a multiple regression that involves including the specific AEM and REM variables and general variables and financial ratios. The first stage follows the Jones and Modified Jones for REM and Roychowdhury (2006) for REM.

Cohen et al (2008) observe that the use of a time trend analysis as a methodology in analyzing the movement of EM is much more plausible as the data involved is not static. They state that they ‘’choose this procedure to describe the variables because many of their variables exhibit significant time trends (non-stationary), rendering traditional summary statistics uninformative". Time trend analysis also enables the researcher to avoid drawing conclusions about an increasing or decreasing trend that may not be due to the examined events but chance variation. In this analysis, observations are drawn for the various variables at the same time intervals in this case the data is yearly for the various firms of the respective FTSE indices. Time trend analysis may be backward looking but it also helps policy makers to forecast and plan for the future. This form of analysis enables organizations or governments to not only monitor the available data over a period of time however they can also forecast or envisage what the future behavior or patterns will be and have some sort of contingency plan in place that anticipates this occurrence. In general, a time trend

analysis enables us to compare the data from one time period to that of another era. It also aids in investigating the movements and pattern of change over time and finally, it can act as a basis or foundation for making future projections.

For this study, I ran the regressions over the entire period for both AEM and REM. I replicate the methods used in Cohen et al (2008) which involve the variables of time and two dummy variables Corporate Scandal Period (SCA) and the Sarbanes Oxley Act (SOX). In their approach, they state that ''time is defined as the difference between the year and 1987. The two dummy variables SCA which takes the value of 1 in the scandal period (years 2000 and 2001) and 0 otherwise, and SOX which takes value 1 in the post-SOX period (years 2002, 2003, and 2005) and 0 otherwise''. For this study, I use time and the financial crisis period as the variable. For time, this is the difference between the respective year and 2004. For the financial crisis, I use 1 for the financial crisis years that is 2007 and 2008, and 0 otherwise. I do this for the three indices that is FTSE 100, FTSE 250, and FTSE Small Cap. I also include the other variables. From these we can interpret the coefficient of the regression to observe the movement of the magnitude of the discretionary accruals during the financial crisis periods as well as their significance. I then compare these for both those firms that have positive and negative residuals. Finally, I provide a graphical representation of the movement of the positive and negative discretionary accruals over the entire period with a special emphasis on the financial crisis period (2007 and 2008). The graphical representation does provide a pictorial statistical image of when EM peaks for firms that have either positive or negative discretionary accruals and when this reverses. This is also informed by Cohen et al (2008), who use this method to establish the trend for when the SCA period is associated with a high level of EM for both positive and negative discretionary accruals and if these trends reverse in the post-SOX period.

For REM, Cohen et al (2008) do the same for all three abnormal formulae values. They then compare the movement over the sample period and before and after the SCA and SOX periods. I do the same for this study and use the same time trend regression method for REM that is time is the difference between the respective year and 2004. For the financial crisis. I use one for the financial crisis years that is 2007 and 2008 and zero otherwise, I replace the discretionary accruals residuals with the positive and negative residuals for abnormal production costs, cash flows, and discretionary expenses values. I do these for all three respective indices that is FTSE 100. FTSE 250, and FTSE Small Cap. I run the results for AEM and REM side by side to provide evidence as to the dichotomy of the movement of both EM methods and whether there is a substitution between the two that is if when one method increases the other decreases. A special emphasis will also be on the comparison of the co-efficient for both EM methods. I run regressions that include both AEM and REM in the model, this regression also incorporates the variables such as general variables, the specific AEM and REM variables as well as the financial ratios. I provide the equations for REM regressions below.

REM $_{i, j}$ (abnormal production) = f (AEM, REM abnormal Cash flows, REM Abnormal discretionary expenses, time, financial crisis, instruments for REM, controls);

REM $_{i, j}$ (abnormal cash flows) = f (AEM, REM abnormal production costs, REM Abnormal discretionary expenses, time, financial crisis, instruments for REM, controls);

REM $_{i, j}$ (abnormal discretionary expenses) = f (AEM, REM abnormal production costs, REM abnormal discretionary expenses, time, financial crisis, instruments for REM, controls);

The study shall also involve further tests that enable us to have a broader understanding of the financial constraints that impact on the use of EM. These tests will provide additional proof that the empirical analysis undertaken by this thesis encapsulates other accounting ratios that may be of interest to other users of financial statements. The test should provide results that should give us confidence that the data has been analyzed in a durable way therefore other techniques and accounting methods would support the various claims put forward. The comparable financial ratios include selecting suitable methods for measuring certain metrics for example other than interest cover which enables us to distinguish firms that may be near to breaching their debt covenants. I shall also include other leverage ratios to check if they follow the same trend. An example of these ratios include the debt-to-equity ratio which is intended to compute the extent to which the firm is financed by debt. The expectation is that firms with high debt financing would have a strong motivation for using EM either via AEM and REM depending on other characteristics. They should therefore have a dissimilar EM movement as compared to firms with lower debt-to-equity ratios. Another accounting ratio that I will use is the Debt to Earnings before Interest, Tax, and Depreciation (EBITDA), this formula enables us to also understand the financing levels of the firm. For working capital other measures to test liquidity levels such as acid test ratios as well as computing the working capital by inclusion of other metrics to obtain the net working capital. An example is to deduct the inventory element from current assets and compute the ratio to current liabilities to obtain the acid test ratio also known as the quick ratio. The results for this are compared to the working capital ratio which is the current assets to current liabilities. Inventory is also included in the current assets.

CHAPTER 4: EMPIRICAL DISCUSSION

In this chapter I discuss the results and findings of the study, I examine the empirical results and the implications that this has for various stakeholders. I enumerate the descriptive statistics results for a first-order analysis. I compare the results for the descriptive statistics and the previous paper. This paper goes further and outlines the inferential statistics vis-à-vis their response to the set-out hypothesis. This empirical discussion segment provides answers to the questions and objectives set out in the introduction. I first provide below the number of firms that were analyzed from the FTSE All Share list as obtained from the Russell FTSE All Share list. I then exclude firms involved in trusts, investment funds, stock indexes, and trackers. Firstly I omit these firms due to the nature of their operations. They contribute a significant reason for the reduction in the number of FTSE All Share firms as compared between the years 2004 to 2018. The exit of these firms post the financial crisis is evidenced by the decline in the number of firms from Russell Company FTSE All Share as compared to the pre-crisis number of the firm's raw data. Secondly, these firms have a dissimilar reporting structure on Datastream from other firms. Due to their operations, their income statement and profit and loss are dissonant with the other firms hence I exclude these firms from the sample. I also omit firms that are privatized or exit the stock market. I thereafter downloaded the remaining firm's financial statement from Datastream. The table showing the movement of stages of getting to the final sample is shown below with financial services such as banks and without banks that have the same reporting structure as the other firms.

Table 3: ***FTSE ALL Share Sample size and stage from raw list to final numbers***

Year	Total No of FTSE ALL Share Firms- Russell raw data list	No of FTSE All share firms excluding firms under investment, indexes, stock trackers, trusts and funds.	No of FTSE All share firms after excluding firms acquired, privatized, liquidated or exiting the stock exchange.	Total sampled with data available from Data stream including financial services firms	Total sampled firms with data from data stream excluding financial services firms
2004	702	541	429	381	300
2005	709	539	427	385	310
2006	683	534	426	384	312
2007	698	525	422	388	323
2008	674	503	429	389	322
2009	619	459	424	393	327
2010	623	460	419	387	322
2011	627	456	418	376	314
2012	624	448	415	371	345
2013	604	433	417	368	314
2014	623	453	418	366	311
2015	644	457	412	356	300
2016	643	454	402	343	291
2017	636	453	403	359	281
2018	641	452	404	349	273

Table 4: ***FTSE ALL Share Sample for each size number of firms and firms with zero inventory***

Year	FTSE 100(No of firms)	FTSE 250 (No of firms)	FTSE SMALL CAP (No of firms)	Total No of Firms	Firms with Zero Inventory (FTSE 100 Only)	Firms with Zero Inventory (FTSE 250)	Firms with Zero Inventory (FTSE Small Cap)	Total firms with zero inventory
2004	58	132	110	300	2	11	13	26
2005	60	134	116	310	3	13	22	38
2006	60	139	113	312	3	13	17	33
2007	61	143	119	323	3	12	16	31
2008	61	143	118	322	3	12	15	30
2009	59	147	121	327	4	11	15	30
2010	62	154	106	322	2	19	12	33
2011	60	144	110	314	2	15	11	28
2012	59	161	125	345	2	15	11	28
2013	58	141	111	310	2	15	13	30
2014	58	134	119	311	2	16	13	31
2015	56	128	116	300	2	14	14	30
2016	56	125	110	291	2	15	10	27
2017	56	118	107	281	2	14	10	26
2018	55	113	105	273	2	5	10	17

4.1 DESCRIPTIVE STATISTICS

I discuss the results in this section the descriptive statistics for both AEM and REM that will generally describe the data. I thereafter delve into inferential statistics. The results do show that there was a presence of AEM in firms among all the indices in the period 2004 to 2018, for FTSE 100 there is less of a presence of AEM compared to FTSE 0 and FTSE Small Cap during the financial crisis period. The decline in the use of AEM by FTSE 100 firms is further observed during the financial crisis years with most firms having negative residuals. As compared to FTSE 250 and FTSE Small Cap where we have over twenty companies every year either with positive or negative residuals. FTSE 100 firms have less than twenty firms with positive residuals. These results are for both the Jones and Modified Jones models, there is not a significant difference for both methods. For our yearly sample of approximately seventy firms, we only have eleven companies in 2007 and four companies in 2008 that have positive residuals thus a significant

decline presence of AEM. For FTSE 100, 2008 is the year with the fewest firms that have positive residual.

Another set of descriptive statistics is the median values of the residuals. The median values provide a more dependable cluster of numbers as compared to the average which for the regression models are zero or approach zero thus not entirely useful for analysis. The reason is that assuming the line of best fit then the sum of the residuals will total to zero. For all three indices, the graphs depict sudden steep declines in AEM during the financial crisis years, as earlier discussed this would be in line with most of the papers that investigate AEM during the financial crisis. For FTSE 100 the median of the residuals exhibits a steep decline during the financial crisis that is much more pronounced than the other two indices. The figures below present a result of the median of the residuals for the three indices for the Jones model while figure six is the same for the modified Jones model. I will also discuss the absolute average and median numbers in this section. The graphs five and six illustrate a decline in the median AEM values for the three indices in the financial crisis years which is comparable to outcomes from previous papers that depict a decline in AEM during the financial crisis with the improved quality of financial reporting. This just provides us an initial glance of the results, the inferential statistics later in the segment will provide a deeper understanding of the relationships and basis of this paper's conclusions.

Figure 5**: AEM JONES median values for residual**

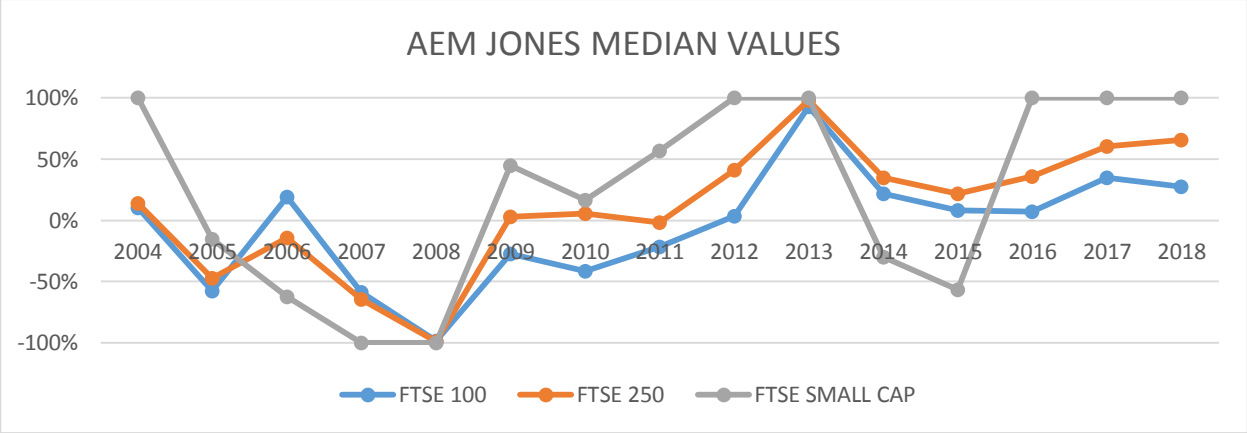
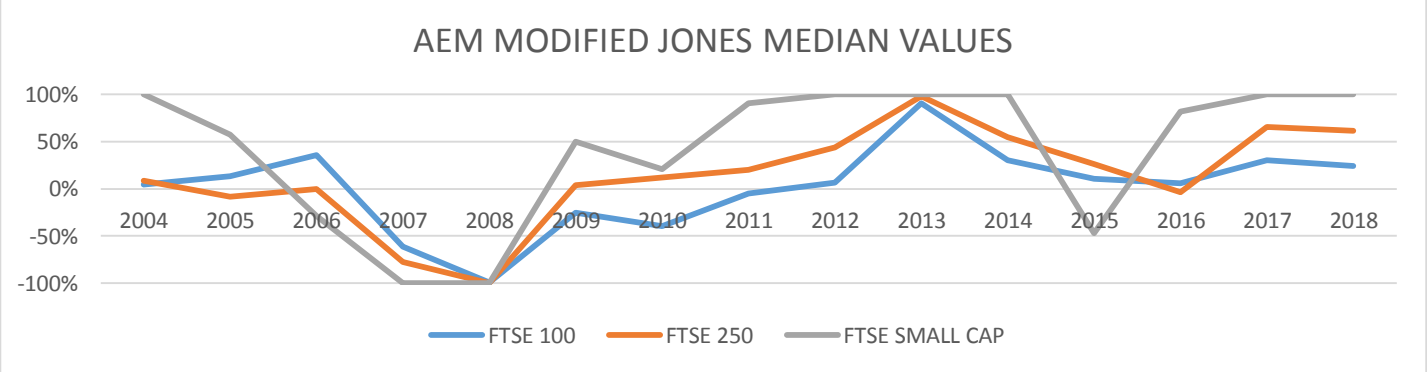


Figure 6**: AEM JONES median values for residual**



The REM median numbers do not show such evident interchangeability in the periods during the financial crisis as compared to before or after the economic downturn years. For abnormal production costs, there is no evidence of a steep increase in the positive residuals during the financial crisis years. The descriptive numbers show that there are also firms with positive residuals in the years before and after the financial crisis and these positive residuals are not augmented in the financial crisis years. This is the same for all three indices. For abnormal cash flows, there is no increase in the median of the negative residuals for the FTSE 100 and FTSE 250 while FTSE small-cap firms have a positive median residual during the financial crisis period hence a decline in the same. Abnormal discretionary expenses also do not show an increase in the median for the negative residual during the financial crisis period.

The graphs 5 and 6 show the movement in the median values of the residuals from the year 2004 to 2018 for both the Jones and Modified Jones models. Nevertheless when separating the positive and negative residuals the descriptive results show few FTSE 100 with positive residuals for both the Jones and modified Jones models during the years 2007 to 2008. The FTSE 250 and FTSE Small Cap have a more or less even split between the number of firms with positive and negative residuals during the financial crisis years. The descriptive results for REM are also diverse. All three indices have evidence of firms engaging in either abnormal production costs, abnormal discretionary expenses or abnormal cash flows during the period 2004 to 2018. The results show that a greater proportion of FTSE 100 firms use abnormal production costs as compared to those that do not, this is observed by those with positive residuals being more than those with negative in every year. The descriptive median numbers show that the years 2007 and 2008 had the highest level as compared to the other years.

For the FTSE 250 and FTSE small caps the descriptive statistics reveal that firms did use abnormal production costs during the financial crisis period however the median values do not show an increase during the financial crisis. The same is also observed for the abnormal cash flow and abnormal discretionary expenses as shown in the graphical representation of figures seven, eight, and nine below. These descriptive statistics for AEM and REM residuals just provide us with an overview of the movement of EM. The REM median results are also shown in the following graphs.

Figure 7**: REM Abnormal Production costs Median for residual**

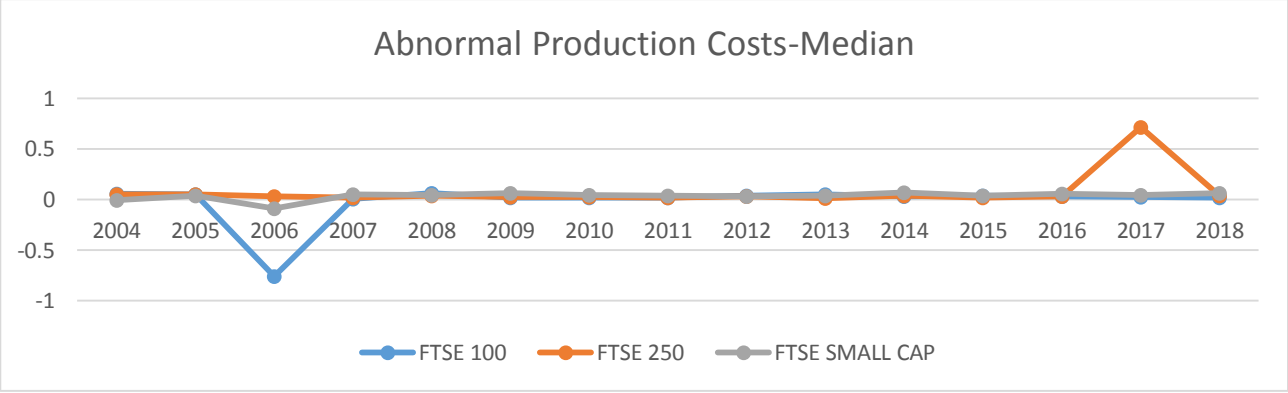


Figure 8: **REM Abnormal Cash Flows Median for residual**

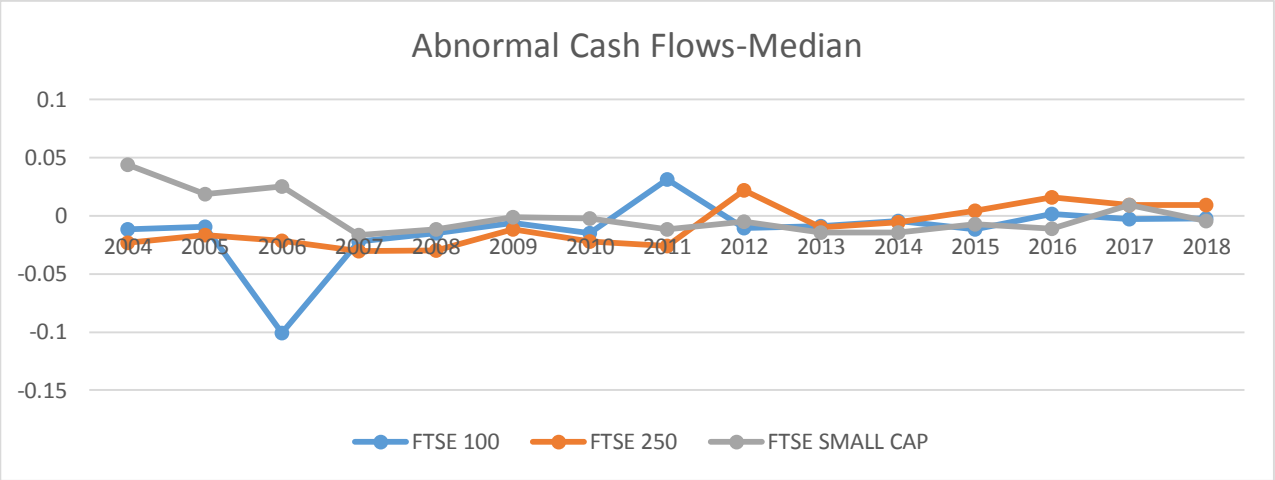
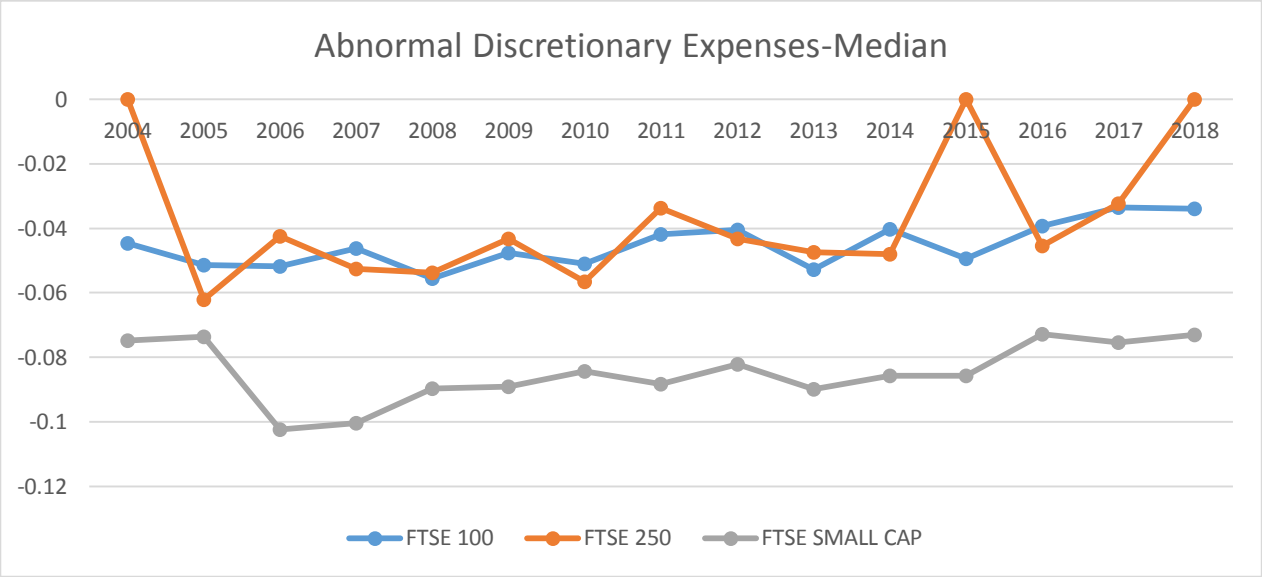


Figure 9: **REM Abnormal Discretionary Expenses Median for residuals**



I also compute the absolute values. As already discussed in this paper the average for the discretionary accrual values and abnormal REM operational values for the firms when regressing the financial data in every year is zero or approaching zero. I therefore calculate the absolute values. Just like Cohen et al (2008) the descriptive statistics in this paper compare the absolute values for the firms with the positive and negative residual values. They state that the reason for the use of absolute values is '' because our hypothesis does not predict any direction for earnings management''. Hence we investigate both sides and signs of the discretionary accruals. This paper's results mirror Cohen et al (2008) who note that ''positive discretionary accruals (Positive DA) are on average larger in magnitude than negative discretionary accruals (Negative DA)''.Cohen et al (2008) compare the absolute discretionary accruals over the period 1987-2005, with periods for Pre-Sarbanes Oxley Act, Corporate Scandal, and Post – Sarbanes Oxley period. This paper follows the same methodology for absolute values however the comparison is between

the normal years that is 2004 to 2006 and financial crisis period of 2007 and 2008 and the post-financial crisis period for the years 2009 to 2018. The findings of the descriptive statistics of absolute values for Cohen et al (2008) concur with this paper. There is a sharp increase in the AEM absolute average accruals for the Jones, modified Jones, and Kothari values same as observed for Cohen et al (2008)

The Kothari model results are shown in appendix CVII. McNichols (2002) absolute values results are indifferent, there is an increase in the years 2006-2007 and 2008-2009 and a decrease in the years 2007-2008. These are shown in the appendix CVIII. I discuss the absolute values results and other regression results for McNichols (2002) later in the hypothesis results and the reasons for the deviation in these results as compared to Jones (1991), Modified Jones, and Kothari model. I show in this segment the absolute results for the Jones and Modified Jones which are depicted in the tables below. The graphs show the difference in the absolute values for the negative and positive average discretionary accruals which increases during the financial crisis period for the sampled firms. Cohen et al (2008) note that the decline of the absolute discretionary accruals post the Sarbanes Oxley act could be due to the increased vigilance of auditors and regulators. However, they are cautious to attribute this decrease in the post-Sarbanes Oxley Act EM solely to the passage of this legislation.

Figure 10: **Jones Absolute Discretionary Accruals Average residuals**

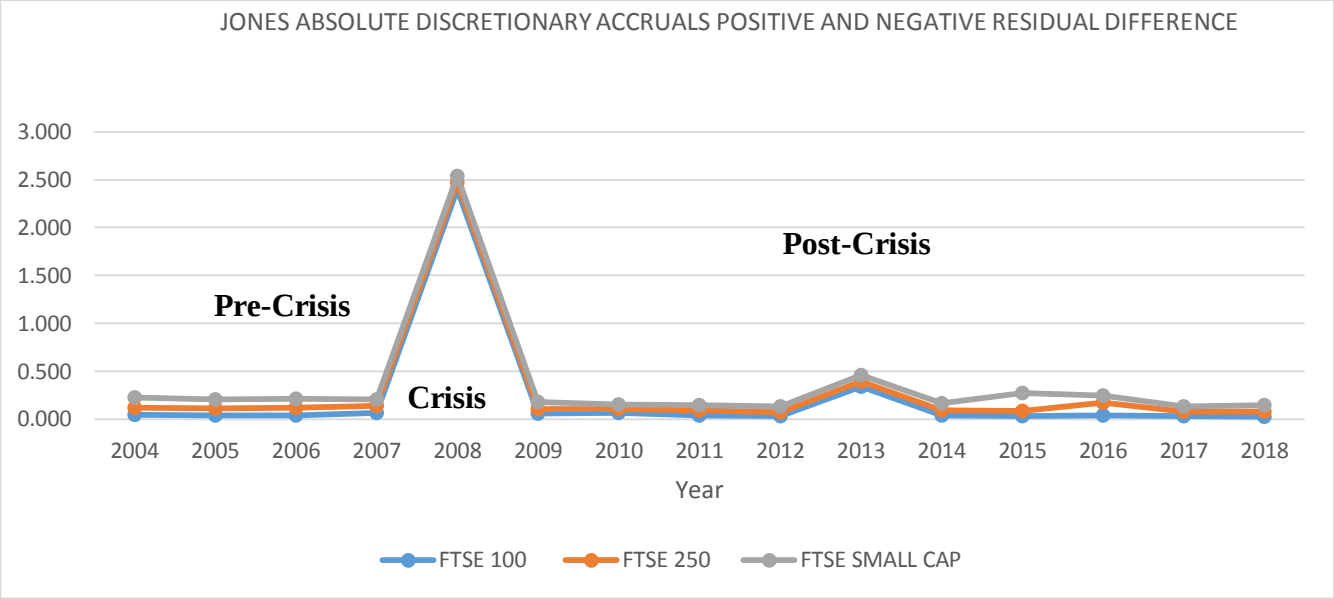
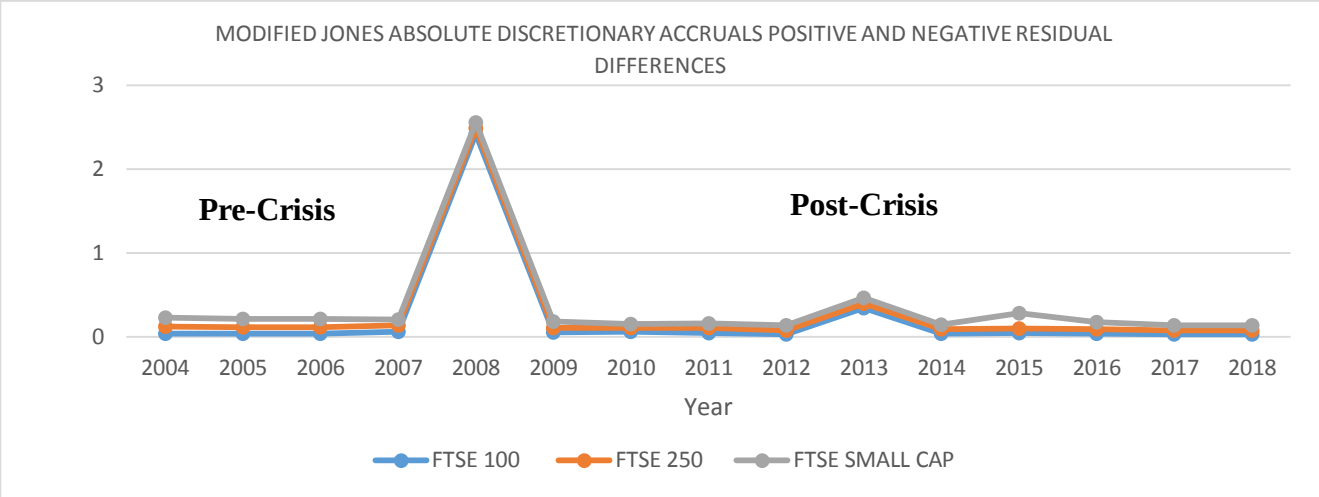


Figure 11**: Modified Jones Absolute Discretionary Accruals Average residuals**



I also compute the absolute values for REM. I compute the absolute values for the positive residuals which will be the same. I reverse the negative residuals to positive as shown in the appendix. I also perform other descriptive statistics tests for the data over the entire sample period, these include sales, total assets, leverage, interest cover, working capital, and total accruals. I do this for the FTSE ALL share and the respective indices. The results of these descriptive statistics are shown in the tables below. In general, the statistics reveal that for example over the sample period of 2004 to 2018 the FTSE all share firms have an average working capital ratio of 1.2 while FTSE 100 is 0.99, FTSE 250 is 1.22 and FTSE Small Cap is 1.45 thus an indication that larger firms have a less ratio of current assets to current liabilities as compared to medium sized or small sized firms. These may not necessarily imply low liquidity problems for large firms but they may have greater access to interim financing if needed as compared to medium and small-sized firms that may face serious liquidity issues if they have lower working capital due to a much more limited access to this funding. Another example is the leverage level which is the ratio of total debts to total assets which shows that FTSE All Share has an average of 0.19 while FTSE 100 is 0.25,FTSE 250 is 0.20, and FTSE Small Cap is 0.16. The observation is that larger firms have a higher ratio of debt level as compared to the total assets. These may also imply that these large firms have a higher capacity to finance their operations from debt.

A final descriptive statistic is on the interest cover that is the ratio of earnings before interest tax and depreciation and the interest expense. The data shows that FTSE all share firms have a median interest cover ratio of 6.85 while FTSE 100 is 8.52, FTSE 250 is 6.54 and FTSE Small Cap is 6.02 which shows that these firms are not necessarily at a financial distress level and unable to service their debt and interest expense. An interest cover of earnings greater than six times to debt interest expense is considered a stable ratio. The interest cover ratios would make us tend to expect that the large firms will have a lower incentive to use EM as their greater ability to meet their debt obligations would be a less incentive and motivation for EM

Table 5: **FTSE ALL Share Descriptive Statistics Ratios**

FTSE ALL SHARE	Average	Median	Standard Deviation
Interest Cover	243.9814859	6.853088481	11470.53516
Leverage	0.197138805	0.162035853	0.20753113
Working Capital	1.25158072	0.973733583	6.87239196
Total Accruals	-0.037615572	-0.022356495	0.123676985
Operating Cycle	-6.112969289	16.50547381	248.7573525
Sales	£4,334,601,499	£349,481,000	
Total Assets	£6,102,978,193	£513,680,000	

Table 6: **FTSE 100 Descriptive Statistics Ratios**

FTSE 100	Average	Median	Standard Deviation
Interest Cover	78.02816775	8.524814856	1790.031906
Leverage	0.248207395	0.228006053	0.185706735
Working Capital	0.993352483	0.9406969	0.938181148
Total Accruals	-0.033419282	-0.026944664	0.065946852
Operating Cycle	39.55582915	24.87483123	225.5101648
Sales	£19,667,802,584	£4,955,233,000	
Total Assets	£27,792,271,726	£6,112,000,000	

*Table 7: **FTSE 250 Descriptive Statistics Ratios***

FTSE 250	Average	Median	Standard Deviation
Interest Cover	445.602734	6.544303797	16959.786
Leverage	0.203259473	0.15625553	0.20758138
Working Capital	1.22032528	0.968045899	2.171364232
Total Accruals	-0.035635227	-0.022353505	0.105169542
Operating Cycle	-73.35712198	14.41025685	3142.489754
Sales	£1,179,944,583	£1,960,600,000	
Total Assets	£1,879,183,276	£799,412,000	

*Table8**: FTSE Small Cap Descriptive Statistics Ratios***

FTSE SMALL CAP	Average	Median	Standard Deviation
Interest Cover	75.58685212	6.023473028	1008.382692
Leverage	0.160914498	0.119891642	0.212424493
Working Capital	1.454185786	1.025250582	11.36808094
Total Accruals	-0.042753643	-0.017588421	0.164536082
Operating Cycle	55.83941854	15.23098827	1807.43413
Sales	£331,392,989	£155,983,000	
Total Assets	£1,089,988,291	£164,662,500	

These results provide us with a first-order analysis of the movement of the EM residuals for both the AEM and REM aggregated data among the respective indices. However, as discussed in the methodology section I will go further and review them separately that is the positive and negative residuals for both EM components as well as with time series regressions. I have compared the positive residuals for the AEM with the same firm's respective REM components and then gone further to compare the negative AEM residuals with the firm's REM residuals. The essence of this

is to try and obtain an analysis of the movement of the three REM residuals that is abnormal production costs, cash flow, and discretionary expenses for those firms that have positive (increased) residuals for AEM and the same examination is done for those that have negative (decreased) AEM during both the normal periods and during the financial crisis years. This provides us with a picture of these firms that have increased (decreased) AEM and also have decreased (increased) REM components thus a substitution effect. Finally as already discussed I perform a time trend analysis for the same. As already mentioned, this thesis has variables that exhibit non-stationary phenomenon hence a time trend analysis is more pragmatic than traditional statistics analysis, the same as has been used in Cohen et al (2008). Even though the multivariate results are the main theme for the results, I will also use the two-stage least squares regression processes for the robustness of the inferential statistics results to investigate the substitution of AEM and REM. The multicollinearity and correlation are also included to enable us to compare these to the multiple regression.

4.2 HYPOTHESIS RESULTS

As already stated, this paper has several hypotheses to be tested that would enable us to arrive at a conclusion that provides us with reasonable evidence as to the use of EM during the financial crisis. I discuss in this segment the findings and empirical results for the hypotheses. I outline responses to each of the hypothesis based on the empirical results.

The first hypothesis states that.

H1: UK-listed firms engaged in either income-increasing accrual-based earnings management or income-increasing real earnings management in response to the financial crisis.

The descriptive results show that large firms used less AEM as opposed to medium and small-sized firms. For inferential statistics, there is also evidence of a relationship between the use of REM and the FTSE 100 firms during the financial crisis. For AEM, the observation is not strong enough to prove a substitution effect for all the three REM methods however the least squares regression and correlation results show a substitution for abnormal production costs. On the other hand medium and small-sized firms use both forms of EM. The time trend analysis results reveal that there is a significant relationship between the positive and negative residuals for the FTSE 100 and the financial crisis period for AEM. The results do not provide general evidence that there was a uniform decline in the use of EM by all UK firms during the financial crisis period as the same is not observed for the FTSE 250. However, there is a significant relationship with the negative (decline) AEM residuals for FTSE 100 and FTSE Small Cap during the financial crisis period.

For REM, the least squares regression provides evidence of the use of EM by this method during the financial crisis. For example, the positive abnormal production costs which is an increase in REM provide an observation of the significant relationship with the financial crisis for FTSE 100. There is also a significant relationship between FTSE 250 firms with an increase in income levels through the abnormal discretionary expenses as evidenced by the movement of the negative

residuals. The same (negative residual movement for abnormal discretionary expenses) is evidenced for FTSE Small Caps. The observation from the results is that firms of the three sizes may not use all three REM methods in the same way however they might invoke one or two between the abnormal production costs, abnormal cash flows and abnormal discretionary expenses techniques. Nevertheless, the results do provide evidence of the presence of REM by firms of the three FTSE All Share sizes during the financial crisis. I provide evidence of the same below for the significant relationship by including the regressions for FTSE 100 abnormal production costs for the positive residuals and the FTSE 250 and FTSE Small Cap abnormal discretionary expenses for the negative residuals. However the entire set of results for both the positive and negative residuals for the three REM methods and indices are shown in the appendix section from LVIII to LXXV. The other results are not included in this segment as they are not significant in relation to the financial crisis. For example, there is no significant relationship between the financial crisis and the negative residuals for the abnormal cash flows and abnormal discretionary expenses for the FTSE 100. I therefore provide the results for the positive residuals for the abnormal production costs for the FTSE 100 firms which has a significant relationship with the financial crisis. The same applies to the FTSE 250 and FTSE Small Cap in the results tables that show they have a significant relationship with abnormal discretionary expenses and negative residuals.

Other papers such as Ghafran et al (2022) exclude the use of abnormal production costs due to the lack of data. The main reason for this is the lack of inventory elements or numbers for firms in certain industries. This paper has included the use of abnormal production costs. Data has been obtained from Data stream. Firms with no inventory have a value of zero. Firms with zero inventory from Data stream are mostly those in finance such as trust, investment or funds. This thesis omits these firms. The sample firms as obtained in this thesis have a less number with zero inventory. For example to take 2004 and 2005 as an example. For the FTSE 100 firms in 2014 of the 58 sampled firms only two firms have zero inventories. In 2005 of the 60 sampled firms only three have zero inventories. For FTSE 250, in 2004 of the 132 firms only 11 have zero inventories and in 2005 of the 134 sampled firms only 13 have zero inventories. for FTSE Small Caps in 2004 of the 110 sampled firms only 13 had zero inventories and in 2005 of the 116 sampled firms only 22 had zero inventories. If we combine the three indices in 2004 there are 9% with zero inventories and in 2005 there were 12% with zero inventories. Other papers have a higher value of firms with no inventory data depending on their sectors of investigation. Ghafran et al (2022) state that ‘’measuring this variable requires firms inventory data, and many of the firms in our sample of firms lack these data. These firms operate primarily in the services and travel and leisure sectors and together these sectors represent over 35 percent’’. Therefore including the firms such as trusts, funds, and stock trackers that I have excluded would provide a higher percentage of zero or lack of inventory in my final sample. However, the omission of these firms for the reasons earlier mentioned also avoids the element of no inventory information.

The data also includes a good proportion of firms that provide services. Whereas the FTSE 100 index has firms in the support services industry, the FTSE 250 has a number of firms in the travel and leisure industry. The firms in these industries have inventories and others have zero inventory. The travel and leisure firms have data for inventory which is not zero. Some firms in the travel and leisure industry are in a constraint in that they would be unable to quickly expand inventory.

Baltazar and LI (2021)state that ‘’Unlike manufacturing firms where the production of goods can be adjusted according to the demand of customers, hospitality firms do not have the ability to alter the capacity of the changing demand of guests in a short period of time’’. Therefore the firms will price the inventory so that they can maximize a good return. The constraint in the inventory will lead to the use of nimble strategic pricing, principles of space inventory and displacement analysis. Toh et al (2002) in their study of cruise lines and hotels find that the use of travel agents by cruise-lines is an important strategic management tool to reduce inventory. In their study in 2003, they observed that cruise lines with 95% occupancy have a lower available inventory as compared to hotels at 59%. The use of travel agents for tracking inventory and the use of systems to track no-shows, upgrades, cancellations of reservations, and late arrivals is important in this industry. Toh and Dekay (2011) observe that when examining the inventory database of firms in the travel and leisure industry, the key themes for investigation are over sales, conventions, walks, no-shows, overbooking, conferences, and meetings. These are the themes to be searched in the inventory for the travel and leisure industry.

These themes give a good understanding of how inventory is determined and counted in the travel and leisure industry. IAS 2 defines inventory as ‘' assets held for sale in the ordinary course of business (finished goods), assets in the production process for sale in the ordinary course of business (work in process), and materials and supplies that are consumed in production (raw materials)’’. The inventory has three aspects. Firstly is if held to be sold in the course of business. Secondly, if they are still in the process of production. Thirdly, if they are to be consumed in rendering services. The services such as travel and leisure belong to the third definition. The inventory is held for these firms to be used in future services and to generate revenue. The data obtained by Datastream for the firms listed in the London Stock Exchange do not show a significant number of firms with zero inventory. This could be explained by their description of inventory. For example if we take two firms that is Mitchell and Butlers which operates pubs, bars, and restaurants or Rank Group PLC which is a gambling firm that is also involved in the cinema and motion pictures. The data for these firms do not have zero inventory for all the years 2004 to 2018. A firm could have zero inventory in one year however this is not consistent for the same firm in all the years. Their balance sheet has data for inventory that changes year to year. The difference can be seen in firms that are in other industries such as support services, retail, and media for which firms have zero inventory in certain years. Whereas some firms in these industries may have zero inventories this is not consistent for all the firms in the industry for each year. For example, Regus offers support services and has zero inventory in certain years. Mitie Group also offers support services for facilities management however the balance sheet does not have zero inventory in most years. This example is to show that under IAS 2 and the definitions of inventory the element of zero inventory does not negatively impact this thesis. The table 4 above shows the industry breakdown per year and the number of firms with zero inventory every year which is not significant to the overall data sample.

As discussed earlier, previous papers on AEM during the financial crisis show that there is a decline in EM during the financial crisis period. They attribute this to the need to attract quality investment, these studies include Arthur et al (2015) who conclude that firms tend to improve earnings quality during this period. Another study by Cimini (2015) also observed that in a

majority of European countries, there is a decrease in the misrepresentation of financial statements this is attributable to the need for firms to attract investment during this critical time. The graphs as shown in the descriptive statistics tend to support this. However Iatridis and Dimitras (2013) observe mixed results, they find that there is an increase in AEM for firms in Portugal, Italy and Greece listed firms when they investigate AEM among European firms. They explain that this is due to their increased debt levels. They therefore need to improve their profitability, the inverse applies to corporations in Ireland. This paper's results tend to be in line with previous research as regards to AEM during the financial crisis as it relates to FTSE 100 firms and FTSE Small Cap. There is a significant decline in the use of AEM by the FTSE 100 firms and FTSE Small Cap as shown by the regressions. I do not find evidence for the same in the decline in the number of firms with negative residuals for discretionary accruals within the FTSE 250. Furthermore for AEM and REM there is a significant relationship between each other. This paper involves running a multiple regression which involves including all the variables in the computation. This means including REM data when running the AEM results and vice versa. This enables us to detect the significant relationship of each EM method as it relates to the other. For the regressions, there is a significant relationship between the negative and positive residuals with the financial crisis for the FTSE 100. However for FTSE 250, there is no significant relationship with the financial crisis for either the negative or positive residuals. For FTSE Small Cap there is a significant relationship between the negative (decline) residuals and the financial crisis period. I provide the results for the three indices below.

The decline in the use of AEM by FTSE 100 and FTSE Small cap is a reflection of the firm's to avoid punishment by the regulators due to poor reporting quality. As already mentioned the introduction of IFRS in 2005 and improvement of the same by IFRS 10 and IFRS 12 provided the need for firms to be more transparent especially as it pertains to consolidation and relationship to other subsidiaries and investments. Thus the ability to use the leeway provided by financial reporting which is the definition of AEM as already discussed in the literature review of this paper is much more restricted and less of an option for firms. On the other hand, the results show a decline in AEM during the financial crisis which is explained by the arguments that the regulator would be keen at this time as they expect firms to use EM to augment performance and show that they are still financially stable and able to come out of the financial crisis, quicker than their peers. However, the decline in liquidity at this time is still a motivation for firms to use EM. Therefore as the financial regulatory environment becomes stringent then these firms segue from AEM to REM. That is abnormal production costs for FTSE 100 and abnormal discretionary expenses for FTSE 250 and FTSE Small Cap. I provide the decline in AEM for FTSE 100 and FTSE Small Cap below and the use of REM by the different indices thereafter.

Trust in financial statements is important for various stakeholders such as creditors or shareholders. The regulatory architecture such as improvement on IFRS 10 and IFRS 12 are avenues that the financial standards ensure this trust in enhanced. The strengthening of trust provides transparency and accountability on firm's financial statements and managers. Transparency in financial reporting is by firms providing clear and correct position of the company. Accountability is about doing the right thing and the obligations and duties placed on the firm and managers. Heald (2012) notes that trust is underpinned by the principles of

transparency and responsibility. When companies report financial statements that are dependable and precise then the stakeholders can place their confidence on these reports and use them to make decisions. Tschopp and Huefner (2015) observe that trust among shareholders is improved by firms observing the financial standards. The financial reporting standards provide a foundation for a firms financial statements to offer transparent and accountable information. Kolk (2008) elucidates that financial reporting standards is a framework through which firms can accurately disseminate their financial statements to shareholders who can make informed decisions and enable them to consolidate their accounts and compare performance for companies in other countries. The transparency as a principle of financial reporting especially as it relates to consolidated accounts enriches the ability of one to compare the performance of firms across various countries and continents.

Ball (2009) states that ‘’transparency is subtly intertwined with accountability’’. She notes that transparency encourages openness and impacts the way a firm conducts its day-to-day operations. Fung (2014) also notes that corporations implementing the financial reporting standards such as IFRS and GAAP, enable the stakeholders to assess the firm and compare the performance with other domestic and international firms that report in the same manner. AEM and REM by their forms diminish the transparency and accountability. REM is more difficult to detect than AEM which makes it less transparent and a viable option for firms. REM is also under the purview of management hence reducing accountability. As earlier discussed in the literature review, Burnett et al (2012) find that the manager’s ability to use AEM is constrained by quality auditors. Zang (2012) and Bushee (1998) also note that sophisticated investors can be able to find out if a firm has used AEM. Managers can also be punished through claw backs if the financial statements are found to have used AEM. They will be held accountable for EM and their bonuses reversed. Chan et al (2014) note that managers may be averse to AEM due to claw back clauses in their contracts. This is also observed by Babenko et al (2012).

Prior literature shows that REM is a viable option as it is less transparent hence enabling firms to meet their objectives through EM despite its negative impact on growth and future prospects. Graham et al (2005) find that REM is principally an attractive technique that enables firms to meet the set benchmarks as it is less scrutinized by auditors. Evans et al (2015) go on to state that REM is less known even by sophisticated and well-knowledgeable investors. Gunny (2005) and Vorst (2016) observe that when the manager’s incentive for EM is strong and AEM is restricted then REM becomes a motivation. These papers provide evidence of the use of REM by firms despite its detriment when the incentives are quite strong. As earlier discussed in this thesis, the use of EM is ubiquitous, managers will therefore substitute REM for AEM depending on the need to apply either one of these EM methods. Additionally, REM is also a motivation when there is a limitation in the use of AEM due to increased regulation and transparency. Libby and Emett (2014) and Clor-Proell and Maines (2014) find that manager’s choices are altered depending on the level of transparency. There is a trade-off in the costs and benefits that are available to managers. Therefore there is an influence of a firm’s reporting that impacts how managers behave in response to changes in regulations. Ipino and Parbonetti (2017) also support this as they find that REM is used when IFRS standards are implemented.

As earlier discussed, this paper is based on agency theory. Jensen and Meckling (1976) observe that long-term institutional owners are correlated with reduced information asymmetry which enables a firm to perform better and managers to invest better. Stable institutional shareholders are able to learn about a company and monitor the firm closely on a day-to-day basis. Shleifer and Vishny (1986) also note that institutional investors who are normally large and sophisticated are able to monitor a firm either passively or actively and thereby improve performance. They can also exert their influence on the firm as well to have an impact on the governance structures as well as to chart the course of the company. Elyasiani and Jia (2010) state that institutional shareholding has two views, this is either through the size that is proportion, and the length of time which is stability. Whereas some institutional investors may have a large proportion or percentage of shareholding in a firm they may only hold the shares for a short period and then sell this to another institutional shareholder through the stock market. Short-term institutional shareholders may have a passive monitoring assessment of a firm. They will not be involved in day-to-day activities or governance structures nevertheless they will still have the financial capability and accounting expertise to monitor the quality of reporting. Hartzell and Starks, (2003) find that institutional investors will be able to inhibit opportunistic EM.

Zang (2012) and Bushee (1998) find that firms with a greater shareholding of institutional investors will exhibit reduced REM. The increase in institutional investors enhances transparency and accountability. These shareholders can be able to institute mechanisms and technology to monitor the use of AEM by firms. Secondly, they can punish firms that are found to have used AEM. REM, is therefore, a preferred EM method as it is more difficult to detect, furthermore, it is within the purview of management. For FTSE 100 and FTSE Small Cap firms, the results show there is actually a decline in AEM. For FTSE 100 firms the increase in the percentage of institutional shareholding deters their use of AEM whereas for FTSE Small Cap firms the decline in the use of AEM is to avoid punishment by banks. Small firms had withdrawn funds from their facilities during the financial crisis (Block et al 2010) they were therefore aware that the financial institutions, such as banks would be able to detect the use of AEM. The need to be transparent in their financial reporting and avoid being held accountable for poor reporting quality is also a reason for firms to use REM. Other papers also show that segue from AEM to REM is due to increased regulations and vigilance. Cohen et al (2008) observe that the decline of the absolute discretionary accruals after the Sarbanes Oxley Act could be attributed to the increased vigilance of auditors and regulators. Improved regulatory architecture during the financial crisis such as IFRS 10 and IFRS 12 to enhance transparency resulted in a decline use of AEM, it made REM a viable avenue for firms to use EM thus showing that they were still financially strong during this time and would be able to come out of the financial crisis quicker and stronger than their peers.

I provide below the regression results for AEM and REM

Table 9**: FTSE 100 Abnormal Production Costs Positive Residuals**

a. FTSE 100 Dependent Variable: ABNORMAL PRODUCTION (Positive Residuals) Predictors: (Constant), Working capital, time, Debt to Equity, change in GDP, Debt to EBITDA, ABNORMAL CASH FLOWS, tax rate, Debt ratio, ABNORMAL DISCRETIONARY EXPENSES, DISCRETIONARY ACCRUALS, return in equity, Times interest earned, financial crisis, Quick ratio, Risk of bankruptcy

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	P-value.
1	Regression	1.393	15	.093	20.238	.000[b]
	Residual	1.721	375	.005		
	Total	3.115	390			

Coefficient

						95.0% Confidence Interval for B	
	B	Std. Error	Beta	T	Sig.	Lower Bound	Upper Bound
(Constant)	0.094	0.011		8.306	0.000	0.072	0.116
DISCRETIONARY ACCRUALS	0.025	0.010	0.120	2.640	0.009	0.006	0.044
ABNORMAL CASH FLOWS	-0.870	0.071	-0.506	-12.339	0.000	-1.009	-0.732
ABNORMAL DISCRETIONARY EXPENSES	-0.431	0.063	-0.270	-6.878	0.000	-0.555	-0.308
Time	-0.001	0.001	-0.040	-0.953	0.341	-0.003	0.001
financial crisis	0.025	0.012	0.097	2.035	0.043	0.001	0.048
change in GDP	0.001	0.002	0.026	0.644	0.520	-0.002	0.004
return in equity	-0.006	0.008	-0.033	-0.733	0.464	-0.021	0.010
Risk of bankruptcy	0.005	0.002	0.288	2.311	0.021	0.001	0.009
tax rate	-0.001	0.004	-0.015	-0.373	0.710	-0.009	0.006
Debt ratio	0.000	0.000	-0.230	-1.894	0.059	0.000	0.000
Debt to EBITDA	0.000	0.000	-0.020	-0.499	0.618	-0.001	0.000
Debt to Equity	0.000	0.001	-0.008	-0.182	0.856	-0.002	0.002
Quick ratio	-0.036	0.009	-0.204	-4.147	0.000	-0.053	-0.019
Times interest earned	0.000	0.000	0.031	0.678	0.498	0.000	0.001
Working capital	0.017	0.006	0.138	2.761	0.006	0.005	0.029

FTSE 100 Dependent Variable: ABNORMAL PRODUCTION (Positive Residuals)

Table 10**: FTSE 250 Abnormal Discretionary Expenses Negative Residuals**

a. FTSE 250 Dependent Variable: ABNORMAL DISCRETIONARY EXPENSES (Negative Residuals) Predictors: (Constant), Working capital, ABNORMAL PRODUCTION, change in GDP, tax rate, Debt to Equity, DISCRETIONARY ACCRUALS, Times interest earned, Debt to EBITDA, financial crisis, ABNORMAL CASH FLOWS, time, Risk of bankruptcy, return in equity, Debt ratio, Quick ratio

b.

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.461	15	.031	13.663	.000[b]
	Residual	2.181	970	.002		
	Total	2.641	985			

Coefficient							
				T	P-value	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	-0.079	0.004		-19.255	0.000	-0.087	-0.071
DISCRETIONARY ACCRUALS	0.000	0.006	-0.001	-0.049	0.961	-0.012	0.011
ABNORMAL PRODUCTION	-0.007	0.004	-0.058	-1.765	0.078	-0.015	0.001
ABNORMAL CASH FLOWS	0.090	0.015	0.200	6.210	0.000	0.062	0.119
Time	0.002	0.000	0.129	3.971	0.000	0.001	0.003
financial crisis	-0.026	0.005	-0.174	-5.398	0.000	-0.035	-0.016
change in GDP	-0.002	0.001	-0.097	-3.193	0.001	-0.004	-0.001
return in equity	-0.003	0.002	-0.060	-1.471	0.142	-0.007	0.001
Risk of bankruptcy	-0.004	0.001	-0.259	-6.216	0.000	-0.005	-0.003
tax rate	-0.002	0.001	-0.054	-1.830	0.068	-0.004	0.000
Debt ratio	0.000	0.000	0.112	2.673	0.008	0.000	0.000
Debt to EBITDA	0.000	0.000	0.014	0.469	0.639	0.000	0.000
Debt to Equity	0.000	0.000	0.049	1.209	0.227	0.000	0.001
Quick ratio	-0.006	0.002	-0.115	-2.693	0.007	-0.011	-0.002
Times interest earned	0.000	0.000	0.038	1.135	0.257	0.000	0.000
Working capital	0.011	0.002	0.254	5.987	0.000	0.007	0.014

FTSE 250 Dependent Variable: ABNORMAL DISCRETIONARY EXPENSES (Negative Residuals)

Table 11**: FTSE Small Cap Abnormal Discretionary Expenses Negative Residuals**

a. FTSE Small Cap Dependent Variable: ABNORMAL DISCRETIONARY EXPENSES (Negative Residuals)
Predictors: (Constant), Working capital, change in GDP, return in equity, Times interest earned, tax rate, DISCRETIONARY ACCRUALS, Risk of bankruptcy, ABNORMAL PRODUCTION, Debt to EBITDA, time, financial crisis, ABNORMAL CASH FLOWS, Debt to Equity, Quick ratio, Debt ratio

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.856	15	.124	29.055	.000[b]
	Residual	2.428	570	.004		
	Total	4.284	585			

Coefficient							
				T	P-value	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	-0.233	0.008		-30.381	0.000	-0.248	-0.218
DISCRETIONARY ACCRUALS	-0.057	0.032	-0.058	-1.773	0.077	-0.120	0.006
ABNORMAL PRODUCTION	-0.025	0.010	-0.089	-2.583	0.010	-0.045	-0.006
ABNORMAL CASH FLOWS	0.178	0.036	0.175	4.943	0.000	0.107	0.249
Time	0.012	0.001	0.563	16.220	0.000	0.010	0.013
financial crisis	0.030	0.008	0.125	3.561	0.000	0.014	0.047
change in GDP	0.002	0.001	0.051	1.541	0.124	-0.001	0.004
return in equity	-0.002	0.003	-0.033	-0.712	0.477	-0.007	0.003
Risk of bankruptcy	-0.001	0.000	-0.572	-6.914	0.000	-0.001	0.000
tax rate	0.003	0.003	0.034	1.070	0.285	-0.003	0.010
Debt ratio	0.000	0.000	0.521	6.301	0.000	0.000	0.000
Debt to EBITDA	0.000	0.000	0.008	0.246	0.805	0.000	0.001
Debt to Equity	0.000	0.001	0.003	0.067	0.946	-0.001	0.001
Quick ratio	0.014	0.008	0.110	1.750	0.081	-0.002	0.031
Times interest earned	0.000	0.000	0.013	0.393	0.695	0.000	0.000
Working capital	-0.005	0.007	-0.043	-0.686	0.493	-0.018	0.009

FTSE Small Cap Dependent Variable: ABNORMAL DISCRETIONARY EXPENSES (Negative Residuals)

Table 12**: AEM Multiple Regression Negative Residuals for the three indices**

AEM JONES Negative Residuals						
		B	T	P-value	Model	ANOVA
FTSE100	(Constant)	-0.037	-0.933	0.351	R=0.859, R2=0.738, Adj R2=0.729	F (15, 489) =91.600, p=0.000
	A. PROD	-0.053	-0.900	0.369		
	A. CASH FLOWS	0.503	2.490	0.013		
	A. D. EXPEN	0.023	0.224	0.823		
	Time	-0.004	-1.211	0.226		
	F. Crisis	-0.668	-16.845	0.000		
	change in GDP	0.028	4.496	0.000		
	return in equity	0.014	1.084	0.279		
	N.O. Assets	0.000	1.861	0.063		
	operating cycle	0.000	-0.839	0.402		
	Debt Ratio	0.000	0.920	0.358		
	Debt to EBITDA	0.000	-0.072	0.942		
	Debt to Equity	-0.001	-0.393	0.694		
	Quick ratio	0.076	1.967	0.050		
	T.I. Earned	0.000	-30.757	0.000		
	W. Capital	-0.049	-1.564	0.119		
FTSE250	(Constant)	-0.034	-1.904	0.057	R=0.515, R2=0.265, Adj R2=0.253	F (15, 935) =22.473, p=0.000
	A. PROD	0.010	0.431	0.666		
	A. CASH FLOWS	-0.064	-0.849	0.396		
	A. D. EXPEN	0.028	0.516	0.606		
	Time	0.001	0.342	0.733		
	F. Crisis	-0.009	-0.418	0.676		
	Change in GDP	0.003	0.888	0.375		
	return in equity	-0.001	-0.334	0.739		
	N.O. Assets	0.000	-17.981	0.000		
	operating cycle	0.000	1.958	0.051		
	Debt Ratio	0.000	0.596	0.552		
	Debt to EBITDA	0.000	0.117	0.907		
	Debt to Equity	0.000	0.344	0.731		
	Quick ratio	0.010	0.581	0.561		
	T.I. Earned	0.000	-0.085	0.932		
	W. Capital	-0.018	-1.301	0.193		
SMALL CAPS	(Constant)	-0.122	-8.178	0.000	R=0.250, R2=0.063, Adj R2=0.040	F (15, 617) =2.753, p=0.000
	A. PROD	0.005	0.209	0.834		
	A. CASH FLOWS	0.100	1.676	0.094		
	A. D. EXPEN	-0.103	-4.240	0.000		
	Time	0.003	2.508	0.012		
	F. Crisis	0.032	2.089	0.037		
	change in GDP	0.004	1.679	0.094		
	return in equity	0.003	1.406	0.160		
	N.O. Assets	0.000	-0.594	0.552		
	operating cycle	0.000	0.133	0.894		
	Debt Ratio	0.000	-0.013	0.990		
	Debt to EBITDA	0.000	0.114	0.909		
	Debt to Equity	-0.001	-1.126	0.261		
	Quick ratio	-0.028	-1.452	0.147		
	T.I. Earned	0.000	-0.791	0.429		
	W. Capital	0.037	2.215	0.027		

Table 13**: AEM Multiple Regression Positive Residuals for the three indices**

AEM JONES Positive Residuals						
		B	T	P-value	Model	ANOVA
FTSE100	(Constant)	0.196	0.346	0.730	R=0.426, R2=0.181, Adj R2=0.145	F (15, 338) =4.925, p=0.000
	A. PROD	-2.348	-4.455	0.000		
	A. CASH FLOWS	15.225	6.599	0.000		
	A. D. EXPEN	-3.370	-2.417	0.016		
	Time	-0.007	-0.148	0.882		
	F. Crisis	3.068	3.832	0.000		
	change in GDP	-0.090	-0.854	0.394		
	return in equity	-0.517	-1.463	0.144		
	N.O. Assets	0.000	-0.812	0.417		
	operating cycle	0.000	-0.052	0.959		
	Debt Ratio	0.000	0.395	0.693		
	Debt to EBITDA	0.077	1.024	0.306		
	Debt to Equity	0.050	0.859	0.391		
	Quick ratio	-0.260	-0.638	0.524		
	T.I. Earned	-0.001	-0.563	0.574		
	W. Capital	0.069	0.214	0.830		
FTSE250	(Constant)	0.056	7.025	0.000	R=0.312, R2=0.097, Adj R2=0.078	F (15, 721) =5.166, p=0.000
	A. PROD	0.016	1.844	0.066		
	A. CASH FLOWS	-0.064	-2.273	0.023		
	A. D. EXPEN	-0.013	-0.685	0.493		
	Time	-0.003	-4.087	0.000		
	F. Crisis	-0.001	-0.156	0.876		
	Change in GDP	-0.001	-0.646	0.518		
	return in equity	0.003	0.862	0.389		
	N.O. Assets	0.000	-0.744	0.457		
	operating cycle	0.000	-2.254	0.025		
	Debt Ratio	0.000	2.726	0.007		
	Debt to EBITDA	0.000	1.506	0.133		
	Debt to Equity	0.000	-0.644	0.520		
	Quick ratio	-0.007	-1.519	0.129		
	T.I. Earned	0.000	-1.079	0.281		
	W. Capital	0.019	5.020	0.000		
SMALL CAPS	(Constant)	0.057	1.850	0.065	R=0.425, R2=0.181, Adj R2=0.158	F (15, 530) =7.802, p=0.000
	A. PROD	-0.107	-2.040	0.042		
	A. CASH FLOWS	-0.357	-3.187	0.002		
	A. D. EXPEN	-0.081	-1.696	0.091		
	Time	0.002	0.618	0.537		
	F. Crisis	0.010	0.282	0.778		
	change in GDP	-0.006	-1.197	0.232		
	return in equity	0.121	6.664	0.000		
	N.O. Assets	0.000	-0.029	0.977		
	operating cycle	0.000	-4.417	0.000		
	Debt Ratio	0.000	-0.218	0.827		
	Debt to EBITDA	0.002	4.985	0.000		
	Debt to Equity	-0.024	-5.365	0.000		
	Quick ratio	0.022	0.711	0.477		
	T.I. Earned	0.000	0.219	0.827		
	W. Capital	-0.016	-0.590	0.555		

The AEM results above are identical to the Kothari model formula outcome. As earlier mentioned, for robustness I use Kothari et al (2006) method which includes the return on assets as a

performance-matched discretionary accruals. These results are also compared to Jones (1991) and modified Jones which despite being common among AEM papers have inherent limitations. For this thesis, the results for Kothari model are in line with both the Jones (1991) and modified Jones. FTSE 100 and FTSE Small Cap firms show a decline in the use of AEM evidenced by a significant relationship with the financial crisis for the negative residuals. For the FTSE 250, for both the negative and positive residuals there is a significant relationship with time but not with the financial crisis which indicates that there is a time when there is a decline and increase in AEM when computing results using the Kothari method formula during certain periods but not specifically during the financial crisis period. The results for Kothari model are explained the same as above in that large firms (FTSE100) have a significant shareholding of institutional investors who have the ability to employ qualified professionals to find this out. On the other hand, small firms had already drawn down on their credit lines during the financial crisis period (Block et al 2010). AEM was therefore not as appealing as the banks would also be able to monitor on this as they would be keen to examine if the small firms are able to meet their financial obligations. The banks could institute restrictive actions on small firms if they found a deterioration in the financial reporting quality due to AEM. REM would be attractive to small firms as it is more difficult to detect plus it is under the management's purview hence the banks or auditors would not object. The results for Kothari model are shown in Appendix CV and CVI

The results for McNichols (2002) show that there is no significant relationship with the financial crisis. However, there is a relationship with time for a decrease and increase in AEM. This explains that there may be periods where the McNichols (2002) model reveals an increase or decrease of AEM for the three indices however it is not observed during the financial crisis period. The model provides a link between accruals and cash flows. She notes that this model has a higher explanatory power than other methods such as Jones (1991) that examine only accruals and do not incorporate the cash flows. The financial crisis was a deep declining liquidity hence it is important to include this model for robustness check. Despite its inclusion, it is also imperative to point out the demerits for this model for this thesis that may explain its results and the lack of a significant relationship with the financial crisis period. Dechow and Ge (2006) observe that the matching principle in accounting where the revenues are corresponded to expenses enables accruals to have a better measure of performance as compared to cash flows. Impact of events such as mergers, acquisitions, and divestitures can have an impact on cash flows in times t, t+1, and t-1. This needs to be fined-tuned, in the methodology and sample, unlike this thesis. This improves the comparison of cash flow between the periods. Additionally, when comparing accruals to cash flows it is important to view the persistence of the financial performance. Dechow et al (2010) find that persistent financial performance are inclined to be a superior metric for analysis such as for business valuation. Ohlson (1995) and Call et al (2016) also support this claim by showing that persistent earnings and operating cash flows enable business analysis and other research.

Livnat and Santicchia (2006) note that in the short-term the operating cash flows have a superior information content as compared to accruals. This is up to three fiscal quarters. On the other hand, the accruals have a superior information content in the longer term that is greater than the fourth quarter. For this research, the methodology that investigates financial over several years that is 2004 to 2018 the accruals provide a sound feature. The importance of accruals cannot be

understated. Dechow and Ge (2006) finds that high versus low accrual firms, have dissimilar results when observing accruals and operating cash flows. Whereas in high accrual firms, the accruals improve the persistence of earnings as compared to operation cash flow. In low accrual firms there is a reduction in the comparison of accruals versus operating cash flows. Therefore in these scenarios the accruals as models for AEM perform better than operation cash flows. Nevertheless, it is important to also point out the strength of operating cash flows. Lewellen and Resutek (2019) state that ‘’accruals are a key output of the financial reporting system, encompassing everything) that drives a wedge between earnings and cash flow”. Thus accruals and operating cash flows have both features that affect future earnings estimation. In firms where accruals reverse faster than earnings then operating cash flows have a better correlation to future earnings (Sloan, 1996). Other scenarios where operating cash flows show better results than accruals is when there is a strong association between investment activities and accruals and secondly is how firms respond to shocks in the market and management respond to working capital and profit in this environment (Lewellen and Resutek, 2019).

Therefore the way operating cash flow is defined as well as its composition and interpretation is fundamental to its persistence and its superiority as compared to accruals. Thus the inability of McNichols (2002) to provide significant results during the financial crisis but significant with time does not necessarily invalidate the results provided by Jones (1991), modified Jones and Kothari et al (2006) in this thesis however, it shows the insignificant results for this form of operation cash flows. The results for a different definition and composition of operational cash flows may provide different results. For example, the composition of operational cash flows such as by Kasznick (1999) and other cash flows such as financing and investing activities (Schilit and Perler, 2010) in their regression models may also provide opportunities for further research which I discuss in the final chapter of this thesis. Schilit and Perler (2010) observe that the other cash flows such as investing and financing activities can also be manipulated. Therefore we would be restricting our analysis by limiting our examination only on operating cash flows. IAS 7 provides a guidance on the cash flow statement. In this, the operating cash flows are defined as how ‘’the entity have generated sufficient cash flows to repay loans, maintain the operating capability of the entity, pay dividends and make new investment without recourse to external sources’’. Investing activities are defined as ‘’the extent to which expenditures have been made for resources intended to generate future income and cash flows’’. Finally, financing activities are defined as ‘’it being useful in predicting claims on future cash flows by providers of capital to the entity’’. The accounting standard therefore requires firms to show these three forms of cash flows. Managers can therefore manipulate any of these cash flows. The McNichols (2002) model only uses operating cash flows. Schilit and Perler (2010) elucidate that firms can manipulate cash flows through movements between operating, investing and financing activities. There is an opportunity for investigation of this cash flow movement during normal and financial crisis periods which is not examined in this thesis.

This paper segments firms based on market capitalization that is unlike the other papers. This is explained in the methodology section. The FTSE 100 firms do contain over 80% of the entire market capitalization thus by this metric they are a substantial component. On the other hand, the FTSE ALL-Share comprises 98% to 99% of the entire market by market capitalization thus a

considerable constituent of the London Stock Exchange. Even though the results for the FTSE 100 show a significant relationship in the time trend between the positive and negative residuals and the 2007 to 2008 financial crisis we do not observe the same within the FTSE 250. It is also with these results that I provide a distinction between this paper and previous research in that there may be similarities of this paper and other studies within the FTSE 100 and FTSE Small Cap which are considerable constituents of the FTSE ALL Share and by extension, the London Stock Exchange but we also need to bear in mind that the FTSE 250 firms do not follow the same trajectory thus it is important to distinguish the results to avoid a broad generalization that the results are an overview of the entire stock market. Therefore the explanations provided by Arthur et al (2015) and Iatridis and Dimitras (2013) for the decreased AEM such as the need to attract quality investments during this time could be comparable to FTSE 100 firms that have better-reporting quality during the financial crisis and not necessarily for the other firms of a lesser market capitalization.

Another reason for the decline in the use of AEM by FTSE 100 firms as already discussed is that they have larger institutional ownership such as banks or pension funds that can employ qualified personnel to tease out EM thus the management would be aware that this form of EM will quite often be noticed and could be punished, this also supports the claim by Bushee (1998) on the relationship between EM and institutional ownership as discussed earlier in this thesis. However, the results for REM show that there is still a use of REM during the financial crisis for the FTSE ALL SHARE indices depending on the type of REM method. It is that whereas AEM declines for FTSE 100 firms it is replaced by REM through abnormal production costs while for FTSE 250 there is no evidence for a steep decline in AEM they still use REM through abnormal discretionary expenses as a means to prop up their financial statements. This is also in line with the argument by Bushee (1998), as this paper noted earlier is that high institutional owners would be wary of a decline in discretionary expenses such as research and development as this would have a negative impact in future revenue generation. I discuss the use of AEM and REM by the various sizes in the following hypothesis.

H2: Firms of varying sizes have a dissimilar use of AEM and REM during the financial crisis period.

For the inferential statistics, the time trend analysis includes time and financial crisis as among the variables. l observe a significant relationship between the residuals with the financial crisis years for the FTSE 100 and Small firms for the Jones (1991), modified Jones model, and Kothari method. The results do not show a conclusive decline for FTSE 250. The anticipation in this hypothesis would be that medium-sized firms would have a greater expectation of growth amongst investors who would have more compelling reasons to use AEM to show that they have weathered the financial crisis storm much better than their peers hence are in a healthier position to come out of it quicker and return to normal levels. The AEM results show that this is not the case and does not support this hypothesis, rather the medium-sized firms use REM and abnormal discretionary expenses to be precise. For REM, the FTSE indices use different REM methods that supports the hypothesis. There is a significant relationship between the positive residuals and abnormal production costs for the FTSE 100 but not for the positive residuals for the FTSE 250 and FTSE

Small Caps. For FTSE 250 there is a significant relationship of the positive residuals with time and not the financial crisis period. This implies that the FTSE 250 firms would use the REM abnormal production costs method in other times but not necessarily during the financial crisis period. FTSE 250 and FTSE Small Cap use REM abnormal discretionary expenses as an EM method during the financial crisis. Thus the results do provide evidence of a trade-off between AEM and REM for the firms during the financial crisis. The mechanism depends on the firm size.

The financial crisis results in this thesis are also replicated in Cohen et al (2008) in that there is a substitution between AEM and REM post the Sarbane-Oxley regulation implementation in the US. The same is evidenced during the financial crisis period in the UK firms. The method of substitution depends on the size of the firm and the method of REM used. There may be reasons as to why firms of various sizes would use the different REM methods. Zang (2012) notes that firms will use REM when it is costlier to use AEM. They state that ''the trade-off between real activities manipulation and accrual-based earnings management is based on the relative costliness of the two activities''. The REM discretionary expenses is considered less costly for FTSE 250 and small firms during the financial crisis period. The impact of the negative downturn would be that reducing marketing or research spending during the financial crisis it could have an adverse impact in future revenue generation. Nevertheless, the benefits of obtaining funding or maintaining debt covenants at the current structure would be worth using this EM method for medium and small-sized firms as the other REM methods would be more prohibitive or costly. I discuss the three indices below and the reasons for the results of the different sizes of the firms.

I first discuss on the large (FTSE 100) firms and the results of this thesis. Short and Kessey (2005) find that there has been a significant increase in institutional shareholding in the UK. They state that ''over the last three decades, individual equity ownership has continued to decrease in terms of the total percentage of equity owned from 54% in 1963 to less than 15% in 2002''. Their study is based on institutional shareholding in the UK. Other papers go further and observe that the institutional shareholders prefer large firms. Both Falkenstein (1996) and Gompers and Metrick (2001) elucidate that institutional shareholders such as mutual funds prefer investing in large firms. One reason for this is that large firms are more liquid and they are familiar with. Huberman (2001) describes this behavior as a bias for large firms as one of ''familiarity breeds investment''. The investors are more comfortable with large firms. Merton (1987) explains this investment method in that the rational investors will seek to fund firms that they have more information about. In this case it would be the large firms. Institutional investors will therefore have an impact on both AEM and REM. Firstly they would be able to detect AEM. They can go further to punish this form of EM through claw backs. Jiang et al (2008) in applying the Gov-score find that higher corporate governance which is an element of increased institutional investors would result in a decrease in abnormal discretionary accruals. Secondly, they would be averse of REM through forms such as abnormal discretionary expenses that will result in reduced marketing or research and development. The reduction in such costs would have a negative impact on the ability of the firm to generate future revenue (Bushee (1998). On the other hand, abnormal production costs would result in increased cash outflow. However large firms such as FTSE 100 would be able to absorb such expenses, the benefits would outweigh the costs. This thesis finds that this form of REM is preferred by FTSE 100 during the financial crisis despite its negative consequences. As discussed

earlier, Gunny (2005) finds that REM (in this case abnormal production costs) will be used despite its negative impact on cash flow.

For the medium-sized firms that is (FTSE 250). The expectation would be that medium-sized would use AEM or REM as they are at the growth stage hence need to show that they are in a better position to come out of the financial crisis. Unlike FTSE 100 and FTSE Small Cap, the results do not show a decline in AEM by medium-sized firms. One reason for the insignificant results for FTSE 250 firms is that unlike large firms that control prices hence they can use abnormal production costs or small firms that use abnormal discretionary expenses the FTSE 250 firms do not have the power to control the market hence these inflexibility impacts their use of EM. Datta et al (2011) find that firms with lower market power do not possess the ability to augment prices beyond their costs so as to manage earnings. These firms are also in a dilemma in that firstly if they are in a competitive environment they need to perform better than their peers to attract investors (Markarian and Santalo, 2014). Secondly the pressure from investors for the firms to show that their on a growth trajectory is a motivation for the firms to use EM (Bodie et al, 2013).The question therefore is not if these firms use EM however what form of EM do they use. Burgstahler and Dichev (1997) find that large and medium-sized firms use EM more than small firms. Unlike FTSE 100 which are large firm's wth significant control of the market the FTSE 250 firms are not in the position that they can easily pass the higher prices to customers. Medium-sized firms are at the growth stage seeking to become large hence this limitation (Kale and Loon, 2011). Furthermore, unlike large firms, medium-sized firms would not be in a position to spend significant funds on EM. The large firms can use abnormal production costs such as an increase in inventory. Watts and Zimmerman (1978) explain that large firms would have a higher political cost to meet targets and at the same time have higher monitoring. However, the REM through abnormal production costs would be under the manager's purview. FTSE 250 would have a lower political cost hence they could use abnormal discretionary expenses and defer costs such as marketing or research and development to the following period so as to improve the current year's performance.

For FTSE Small Cap firms. Gertler and Gilchrist (1994) observe that the financial crisis period is evidenced by credit rationing. During this period of credit rationing is also propagated by a decline in liquidity and available funds to small firms. The tightness of credit is much more severe to small firms than large firms. Borio et al (2010) explain that small firms drew down their facilities during the financial crisis period. Thus aware that they would have greater restrictions to finance, the small firms drew down their existing facilities so as to fund their cash constraints at this time as well as to protect themselves against the external shocks. Oliner and Rudebush (1996) and Gertler and Gilchrist (1994) elucidate that small firms are at a disadvantage during the financial crisis period. The rationing of credit at this time drives funds towards large firms and away from small firms. The results show that there is a decline in AEM for small firms during the financial crisis period. A reason for this is that the lenders would be able to detect this form of EM. Small firms having drawn down their credit facilities would be monitored by their lenders. Diamond, (1984) discusses the position of banks to firms in their principal-to-agency relationship. They find that banks have a special monitoring role. Unlike other creditors, banks have a closer relationship with firms. They therefore have greater access to information, some of this is private information that

is not available to other creditors. This could explain the reason for the decline in AEM by small firms that had already drawn down their facilities. However, the results show that these firms used abnormal discretionary expenses as opposed to abnormal production costs or abnormal cash flows. This could be because firstly, REM is less easy to detect than AEM. Secondly, this is under the management's purview and thirdly abnormal discretionary expenses are less costly to small firms. This form of EM has less immediate effect on cash flow however it has a long-term detriment on the firm's value which small firms could find that the benefits at this time outweigh the costs. As discussed earlier in this thesis, Bhojraj et al. (2009) find that firms use abnormal discretionary expenses due to their short-term view. This form of EM is preferred by managers who need short-term augmented results despite the long–term negative impact. The short-term gain would be a strong incentive which would reverse later.

H3: UK-listed firms that are constrained financially engaged in either income-increasing AEM or REM in response to the financial crisis.

The results show that financially constrained firms based on ratios such as interest cover and working capital use both AEM and REM methods during the financial crisis. For this hypothesis, I have dichotomized the firms between those with positive and negative residuals for the three indices that are FTSE 100, FTSE 250, and FTSE Small Cap. For descriptive statistics, I then compare the average and median interest cover and working capital ratios. From the AEM results, FTSE 100 firms with negative residuals have consistently lower average and median interest cover ratio as compared to those with positive residuals. This is also noted during the financial crisis years that is 2007 and 2008. The inference is that firms with low interest cover that is the ratio of earnings before interest tax and depreciation to the interest expense use less of AEM than those with higher interest covers. One of the explanations for this is that firms with higher interest covers have a greater headroom to use AEM as they would have less debt hence less surveillance from their funders. They may not have restrictive debt covenants that require them to disclose certain material items and more so report certain aspects of their financial performance in a specific manner. However, firms with lower interest cover will have more surveillance from their banks or lenders. Even though they will have more compelling reasons to use AEM their financial reporting will be more closely monitored as well the quality of the financial statements. The FTSE 250 and FTSE Small Cap results for the same tend to be much more aligned to that of the FTSE 100 but are not as pronounced as FTSE 100 results. I provide the results below for the Jones for both the average and median firm's interest cover.

Table 14: Average Interest Cover Positive vs Negative Residuals for AEM

AEM (JONES)	NEGATIVE	POSITIVE	DIFFERENCE	NEGATIVE	POSITIVE	DIFFERENCE	NEGATIVE	POSITIVE	DIFFERENCE
AVERAGE	FTSE 100	FTSE 100		FTSE 250	FTSE 250		FTSE SMALL CAP	FTSE SMALL CAP	
2004	21.33	21.52	-0.18	229.06	147.43	81.64	29.67	9.72	19.95
2005	13.82	41.52	-27.70	247.26	340.73	-93.47	208.46	94.37	114.09
2006	19.28	27.44	-8.17	89.28	390.25	-300.97	52.80	181.33	-128.54
2007	13.20	18.21	-5.01	87.95	41.45	46.50	130.22	32.95	97.27
2008	15.26	20.98	-5.73	100.35	67.20	33.14	30.73	190.06	-159.33
2009	11.17	28.13	-16.96	32.88	147.48	-114.60	22.48	103.33	-80.85
2010	24.84	50.75	-25.91	92.02	54.94	37.08	265.34	185.49	79.85
2011	20.96	25.04	-4.08	48.40	235.45	-187.05	35.21	69.03	-33.82
2012	4.08	56.78	-52.69	67.36	115.41	-48.05	54.09	56.76	-2.67
2013	11.50	25.99	-14.49	44.39	54.99	-10.60	52.09	440.65	-388.56
2014	13.61	72.42	-58.81	74.58	51.90	22.68	67.93	44.57	23.35
2015	11.59	112.56	-100.97	17.46	158.17	-140.72	35.84	15.52	20.31
2016	8.92	36.98	-28.06	127.58	82.28	45.30	323.26	25.42	297.84
2017	12.46	89.83	-77.37	94.69	93.28	1.41	408.59	47.79	360.79
2018	15.49	71.47	-55.98	98.67	115.96	-17.29	85.06	78.82	6.25

For Working Capital. A descriptive statistics results show that FTSE 100 firms with negative residuals that are declining AEM predominantly have lower working capital that is the ratio of current assets to current liabilities than those with positive residuals that is increasing AEM however, this is not conclusive for the financial crisis years as firms with negative residuals have higher average and median working capital ratios as compared to those with positive residuals. The FTSE 250 and Small Cap results also tend to follow these results. It is also worth to mentioning that working capital ratios have limitations in that they may be skewed for firms with increased inventory levels which not necessarily may be easily convertible to cash. Thus for firms that will segue towards REM and have higher inventories which increases their cost of production, this may seem to be positive from a working capital perspective however they may have restricted cash flow if they are then unable to convert the inventory to cash. Therefore for AEM, the FTSE 100 interest cover results are much more consistent thus a financial ratio that provides evidence of the difference between firms with different levels of discretionary accruals. I provide the evidence for the working capital financial constraints in the appendix from XXI to XXXIII

For REM, the abnormal production costs results show that the positive residuals for the three indices that is FTSE 100, FTSE 250, and FTSE small caps firms have a lower interest cover than those with negative residuals thus implying that those with lower interest cover have increased use of REM by using abnormal production costs. The same is viewed for abnormal cash flow in that firms with negative residuals that is increasing REM have lower interest cover as compared to firms with positive residuals. This is also observed with the abnormal discretionary expense results for the three indices. This is also evidenced during the financial crisis period that is 2007 and 2008

hence the hypothesis is accepted for REM. As already enumerated, firms that are financially constrained that is have lower interest cover would then prefer to use REM as opposed to AEM this is more so for FTSE 100 firms and abnormal production costs which as also evidenced by the regressions, the positive residuals have a significant relationship with the financial crisis. One of the reasons for this is that REM is less easily detectable and is also under the purview of management. On the other hand, the banks or funders would be able to monitor the use of AEM and could punish the firms for a decline in the financial reporting quality. They could result to increased costs of debt or even claw backs.

The deep declining liquidity and the improved financial regulatory environment would still provide the motivation for firms to use EM. These results show that firms that have poorer financial ratios for interest cover and working capital will use the REM methods as a means to improve their financial performance. Firms would be averse to using AEM as they would be aware that the auditors and regulators would be keen on firms complying with the financial standards. Any adverse opinion would impact their ability to either obtain new loans or maintain their credit facilities at the current or better covenants. REM therefore provides an incentive as an avenue through which management could still use EM so as to access the limited funds that are available at this time while at the time avoid operating against the reporting guidelines. The results show that these firms with poorer financial ratios would therefore use REM.

Table 15**: Average Interest Cover Positive vs Negative Residuals for Abnormal Production Costs**

REM ABN PROD	POSITIVE	NEGATIVE		POSITIVE	NEGATIVE		POSITIVE	NEGATIVE	
AVERAGE	FTSE 100	FTSE 100	DIFFERENCE	FTSE 250	FTSE 250	DIFFERENCE	FTSE SMALL CAP	FTSE SMALL CAP	DIFFERENCE
2004	15.24	21.22	(5.98)	9.27	28.55	(19.28)	27.35	20.32	7.03
2005	15.73	25.56	(9.83)	13.99	23.96	(9.98)	23.01	31.52	(8.51)
2006	0.00	22.51	(22.51)	12.89	22.93	(10.04)	14.23	12.99	1.25
2007	15.97	18.49	(2.53)	11.79	24.24	(12.45)	15.74	19.91	(4.17)
2008	5.15	11.26	(6.12)	10.30	18.17	(7.87)	7.73	19.96	(12.22)
2009	11.59	15.35	(3.77)	21.51	18.28	3.23	17.72	19.19	(1.47)
2010	11.29	16.41	(5.12)	23.65	32.57	(8.92)	16.55	28.69	(12.15)
2011	10.39	24.75	(14.37)	7.27	57.24	(49.96)	12.11	24.10	(12.00)
2012	12.51	22.18	(9.66)	20.98	29.59	(8.61)	13.22	46.58	(33.37)
2013	11.36	18.32	(6.96)	15.93	21.61	(5.68)	12.26	28.65	(16.39)
2014	16.58	17.45	(0.87)	15.48	21.60	(6.12)	13.47	31.96	(18.49)
2015	13.44	18.04	(4.60)	24.27	20.67	3.59	10.13	20.39	(10.26)
2016	14.06	15.46	(1.40)	26.64	22.48	4.16	11.64	36.37	(24.73)
2017	20.87	35.39	(14.51)	18.20	23.99	(5.79)	16.66	23.50	(6.84)
2018	14.63	33.16	(18.52)	28.23	21.71	6.52	14.23	26.79	(12.56)

Table 16: **Average Interest Cover positive vs negative residuals Abnormal Cash flows**

REM ABN CASH FLOW	POSITIVE	NEGATIVE		POSITIVE	NEGATIVE		POSITIVE	NEGATIVE	
AVERAGE	FTSE 100	FTSE 100	DIFFERENCE	FTSE 250	FTSE 250	DIFFERENCE	FTSE SMALL CAP	FTSE SMALL CAP	DIFFERENCE
2004	21.34	19.75	1.59	24.14	12.76	11.38	26.52	34.76	(8.24)
2005	25.84	25.37	0.47	26.81	14.34	12.47	50.23	22.86	27.37
2006	0.00	23.5	(23.5)	17.59	23.80	(6.21)	35.96	11.99	23.97
2007	21.55	41.11	(19.56)	18.94	21.60	(2.66)	52.71	32.00	20.71
2008	14.83	22.37	(7.54)	23.59	7.48	16.11	40.22	11.51	28.71
2009	20.81	18.71	2.10	27.58	7.28	20.30	30.69	32.52	(1.83)
2010	17.05	10.45	6.60	33.65	21.79	11.85	58.63	42.65	15.98
2011	21.11	10.08	11.03	29.20	33.21	(4.01)	31.70	53.68	(21.98)
2012	22.25	9.36	12.89	30.95	18.20	12.74	44.47	27.48	16.99
2013	26.25	11.20	15.05	36.65	28.18	8.47	30.31	49.28	(18.97)
2014	23.06	14.18	8.88	23.35	28.73	(5.38)	27.04	27.93	(0.89)
2015	20.05	11.58	8.47	24.60	32.67	(8.07)	37.34	7.22	30.12
2016	16.89	11.40	5.49	20.06	33.74	(13.67)	31.08	11.63	19.46
2017	23.14	15.42	7.72	21.79	38.82	(17.03)	38.34	22.46	15.88
2018	22.47	11.16	11.31	20.44	36.69	(16.25)	26.44	26.12	0.31

Table 17**: Average Interest Cover positive vs negative residuals Abnormal Discretionary Expenses**

REM ABN DISC EXPENSES	Positive	Negative	Difference	Positive	Negative	Difference	Positive	Negative	Difference
Average	FTSE 100	FTSE 100		FTSE 250	FTSE 250		FTSE Small Cap	FTSE Small Cap	
2004	106.87	17.89	88.99	205.81	139.71	66.10	50.09	54.76	-4.67
2005	42.22	18.33	23.90	42.90	138.60	-95.70	14.73	229.15	-214.41
2006	23.40	22.80	0.59	160.81	102.19	58.62	36.93	139.49	-102.56
2007	67.64	20.22	47.43	62.95	14.92	48.02	67.32	55.46	11.86
2008	82.47	17.09	65.38	54.08	51.34	2.75	219.37	164.40	54.97
2009	38.69	13.21	25.48	91.35	91.35	0.00	120.67	57.03	63.64
2010	33.80	17.19	16.61	174.91	27.49	147.42	50.58	267.89	-217.31
2011	21.09	15.97	5.13	127.13	31.83	95.29	54.08	47.07	7.01
2012	58.89	13.57	45.32	63.60	54.76	8.84	67.63	36.31	31.32
2013	25.22	14.36	10.86	66.70	39.47	27.23	66.71	301.36	-234.64
2014	79.80	16.81	63.00	105.35	45.48	59.88	75.03	27.82	47.21
2015	96.42	23.59	72.83	187.66	40.26	147.40	21.21	498.98	-477.77
2016	29.11	35.15	-6.04	242.24	62.44	179.81	37.89	187.85	-149.96
2017	41.58	47.44	-5.86	89.92	91.07	-1.15	21.01	281.50	-260.49
2018	28.55	58.88	-30.33	78.53	87.57	-9.04	65.52	87.30	-21.78

I also go further and introduce other ratios such as debt to EBITDA (earnings before interest, tax, depreciation and amortization), debt to equity, quick ratio, and times interest earned. I include these ratios in the multiple regression and provide evidence of the significance of AEM and REM between these ratios. For FTSE 100, FTSE 250, and FTSE Small Cap, the negative and positive residuals for AEM and the three REM methods show that there are different significant relationships between the various financial constraints and the independent variables. These results are aligned with the results of the first and second hypothesis in that the financial ratios depend on the use of AEM and REM and at the same time their significance are dependent on the size of the firm as well. I discuss these financial ratios in this section when I delve into the results as they specifically pertain to the financial crisis. These results will also be shown in the multivariate regression tables in the same segment. I discuss the firm's characteristics and their relationship with AEM and REM as pertains to the three FTSE All Share indices in the final fourth hypothesis.

H4: UK listed firms characteristics affect the ability of firms to use income increasing accrual based earnings and real earnings management in response to the financial crisis.

The hypothesis asserts that firm characteristics such as net operating assets or operating cycle as pertains to AEM and tax rates and closeness to bankruptcy for REM are significant factors that determine a firm's characteristics and thereby its propensity to use either of these EM methods. I anticipate that firms with longer operating cycle will have greater room to use AEM they will therefore prefer this method for a longer period before using REM. The results show that this is indeed true, especially for FTSE 250 firms as firms with longer operating cycles based on the

empirical results have a greater propensity for positive discretionary accruals as compared to those with negative residuals. This behavior is also noticed during the financial crisis years. The results for FTSE 100 and FTSE Small Cap also show that firms with positive residuals predominantly have higher operating cycles than those with negative residuals the same is true for both the average and median values as shown in the tables below. The implication for this is that firms with a longer operating cycle have greater freedom and space to use AEM, this is the case in both normal times and during the financial crisis period

For FTSE 100 firms when I separate the positive and negative residuals and compare the average and median operating cycles for the firms I find that the positive residuals predominantly have a higher operating cycle as compared to the negative residuals however for the financial crisis years that is 2007 and 2008 the positive residuals have a higher average and median operating cycle in 2007 but not in 2008. The operating cycle is computed by use of the payable turnover days, inventory turnover days, and accounts receivable days. The formula enables us to observe the time it takes a firm to buy goods, sell them and finally obtain the cash. A longer operating cycle indicates an extended period for a company to sell its goods and receive the cash from debtors. Thus firms can augment sales when operating in such an environment as compared to their peers with lower operating cycles.

Table 18**: Positive vs Negative Residuals AEM for Average Operating Cycle**

AEM (JONES)	FTSE 100			FTSE 250			FTSE SMALL CAP		
AVERAGE	POSITIVE	NEGATIVE	DIFFERENCE	POSITIVE	NEGATIVE	DIFFERENCE	POSITIVE	NEGATIVE	DIFFERENCE
2004	55.99	82.04	-26.05	108.26	28.16	80.10	173.25	50.98	122.27
2005	78.15	60.06	18.09	25.70	44.95	-19.25	139.97	55.09	84.91
2006	65.01	60.09	4.92	80.20	58.52	21.68	52.67	56.48	-3.81
2007	179.60	57.60	122.00	116.80	50.34	66.46	52.39	59.16	-6.76
2008	30.38	71.21	-40.83	92.54	73.02	19.52	67.08	62.03	5.05
2009	83.72	59.11	24.61	82.17	33.60	48.57	42.00	63.73	-21.73
2010	149.00	65.24	83.76	92.75	69.72	23.02	50.16	70.42	-20.25
2011	185.36	81.85	103.50	131.91	49.08	82.82	45.21	70.14	-24.93
2012	27.40	42.38	-14.98	140.40	45.46	94.93	72.81	47.50	25.31
2013	19.33	33.90	-14.57	122.61	39.26	83.35	180.41	55.39	125.02
2014	38.16	27.10	11.05	114.39	52.70	61.69	188.15	50.83	137.33
2015	43.27	45.37	-2.09	114.44	56.14	58.30	72.39	54.77	17.62
2016	45.39	47.48	-2.09	129.57	66.76	62.81	84.99	36.82	48.17
2017	111.61	44.47	67.14	99.39	63.66	35.74	108.41	50.60	57.81
2018	90.60	50.91	39.69	105.96	53.91	52.06	120.39	35.98	84.41

I also anticipate that firms with a greater risk of bankruptcy engaged less in income-increasing REM in response to the financial crisis. The results show that firms with positive residuals that are increasing abnormal production costs have lower Altman Z-scores than those with negative residuals. This is evidenced for all three indices that is FTSE 100, FTSE 250, and FTSE Small Cap. For the abnormal cash flows and abnormal discretionary expenses, the results show that firms

with negative residuals that are increasing REM for these two methods have lower Altman Z-scores as compared to those with positive residuals that are decreasing REM. The results are observed to be the same for all three indices and also hold during the financial crisis period that is 2007 to 2008. A reason that could be espoused for these results is that firms that are performing below par or worse than their competitors will use REM as a means to prop up their financial performance this is even though as already discussed earlier, this form of EM has long term negative consequences on the firm's cash flows and value. The results are contrary to the hypothesis which provides evidence that firms will use REM despite its negative consequences and impact. The regression results also support the significant relationship between the risk of bankruptcy and the REM residuals. I provide a more comprehensive discussion of these multivariate results in the segment that delves into the outcomes and financial crisis.

Table 19: REM Average Risk of bankruptcy abnormal production costs

FTSE 100	Negative	Positive	Difference	FTSE 250	Negative	Positive	Difference	FTSE Small Cap	Negative	Positive	Difference
2004	2.08	1.88	0.19	**2004**	5.07	2.36	2.72	**2004**	45.18	3.09	42.08
2005	1.98	1.89	0.10	**2005**	2.47	2.16	0.31	**2005**	6.52	3.86	2.66
2006	2.47	1.93	0.54	**2006**	2.98	2.19	0.79	**2006**	10.86	5.16	5.70
2007	1.83	1.78	0.06	**2007**	2.96	2.29	0.67	**2007**	6.25	5.98	0.27
2008	1.67	1.57	0.09	**2008**	2.64	2.36	0.28	**2008**	5.28	3.23	2.05
2009	2.49	1.60	0.89	**2009**	2.10	1.88	0.22	**2009**	4.67	2.65	2.03
2010	1.87	1.70	0.16	**2010**	2.41	1.99	0.42	**2010**	3.63	2.76	0.88
2011	2.02	1.72	0.30	**2011**	3.18	2.00	1.18	**2011**	4.99	2.85	2.14
2012	2.05	1.68	0.36	**2012**	2.61	2.28	0.33	**2012**	10.36	2.11	8.25
2013	2.06	1.71	0.63	**2013**	2.49	1.90	0.59	**2013**	4.05	3.12	0.93
2014	1.85	1.85	0.18	**2014**	2.56	1.76	0.80	**2014**	3.13	2.23	0.91
2015	1.84	1.39	0.39	**2015**	2.65	2.03	0.62	**2015**	23.44	2.14	21.30
2016	1.60	1.37	0.28	**2016**	2.18	1.87	0.32	**2016**	3.07	4.45	(1.38)
2017	1.65	1.39	0.39	**2017**	2.36	1.81	0.55	**2017**	2.63	2.05	0.59
2018	1.73	1.49	0.25	**2018**	3.27	1.70	1.58	**2018**	6.51	2.37	4.14

Table 20: REM Average Risk of bankruptcy abnormal cash flows

FTSE 100	Negative	Positive	Difference	FTSE 250	Negative	Positive	Difference	FTSE Small Cap	Negative	Positive	Difference
2004	1.90	1.93	(0.03)	**2004**	2.78	6.11	(3.33)	**2004**	2.27	2.50	(0.23)
2005	1.81	1.88	(0.07)	**2005**	2.21	2.39	(0.18)	**2005**	1.83	2.66	(0.84)
2006	1.89	2.02	(0.13)	**2006**	1.91	3.15	(1.24)	**2006**	1.50	2.87	(1.37)
2007	1.81	1.88	(0.08)	**2007**	2.27	2.76	(0.50)	**2007**	4.12	8.40	(4.28)
2008	1.65	1.86	(0.21)	**2008**	2.30	2.54	(0.24)	**2008**	4.37	1.89	2.47
2009	1.71	1.82	(0.10)	**2009**	1.95	2.12	(0.17)	**2009**	1.92	1.73	0.19
2010	1.72	1.84	(0.12)	**2010**	2.19	2.50	(0.31)	**2010**	1.82	2.02	(0.20)
2011	2.82	-	2.82	**2011**	2.46	3.48	(1.02)	**2011**	2.19	3.22	(1.02)
2012	1.69	1.90	(0.21)	**2012**	2.37	2.98	(0.61)	**2012**	1.60	1.39	0.21
2013	1.69	1.87	(0.19)	**2013**	2.87	2.05	0.82	**2013**	1.62	2.17	(0.55)
2014	1.71	1.79	(0.07)	**2014**	2.16	3.36	(1.20)	**2014**	3.26	2.08	1.18
2015	1.76	1.67	0.09	**2015**	2.35	2.65	(0.30)	**2015**	2.09	8.33	(6.23)
2016	1.51	1.58	(0.07)	**2016**	2.23	1.73	0.50	**2016**	6.85	1.65	5.20
2017	2.15	1.57	0.81	**2017**	2.12	1.86	0.26	**2017**	2.31	1.53	0.78
2018	1.46	1.80	0.03	**2018**	1.80	2.85	(1.05)	**2018**	1.64	1.46	0.18

Table 21: REM Average Risk of bankruptcy abnormal discretionary expenses

	Negative	Positive	Difference	FTSE 250	Negative	Positive	Difference	FTSE Small Cap	Negative	Positive	Difference
2004	2.10	1.90	0.19	**2004**	3.05	2.24	0.81	**2004**	5.51	7.27	(1.77)
2005	1.83	2.32	(0.49)	**2005**	2.56	3.49	(0.93)	**2005**	6.93	8.25	(1.33)
2006	2.05	2.37	(0.32)	**2006**	2.38	4.72	(2.34)	**2006**	4.85	4.89	(0.04)
2007	2.02	2.21	(0.18)	**2007**	2.41	3.44	(1.03)	**2007**	4.77	6.15	(1.37)
2008	1.86	1.87	(0.00)	**2008**	1.88	3.30	(1.42)	**2008**	3.37	6.14	(2.77)
2009	1.89	1.98	(0.09)	**2009**	2.16	4.19	(2.03)	**2009**	2.67	5.69	(3.02)
2010	1.78	1.98	(0.20)	**2010**	2.61	4.11	(1.50)	**2010**	3.36	4.44	(1.08)
2011	2.03	2.08	(0.05)	**2011**	2.34	5.80	(3.46)	**2011**	3.09	5.81	(2.72)
2012	1.76	1.88	(0.12)	**2012**	2.63	3.24	(0.61)	**2012**	3.62	5.29	(1.67)
2013	1.69	1.76	(0.07)	**2013**	2.18	6.37	(4.19)	**2013**	2.21	4.20	(1.98)
2014	1.53	1.60	(0.07)	**2014**	1.97	2.22	(0.25)	**2014**	3.69	3.69	0.00
2015	1.47	1.65	(0.17)	**2015**	2.58	7.44	(4.86)	**2015**	2.29	4.31	(2.02)
2016	1.23	1.33	(0.10)	**2016**	0.84	0.74	0.10	**2016**	4.13	1.81	2.32
2017	1.77	1.17	0.60	**2017**	2.99	2.16	0.83	**2017**	4.00	2.36	1.64
2018	1.48	1.81	(0.32)	**2018**	2.86	2.10	0.76	**2018**	2.98	3.65	(0.67)

I also hypothesize that firms with greater tax rates engaged less in income-increasing REM in response to the financial crisis. This is evidenced when I separate the positive and negative residuals and then compute the average and median tax rates for the three indices that is FTSE 100, FTSE 250, and FTSE Small Cap yearly between the periods 2004 to 2018. The results show that for abnormal production costs the firms with positive residuals predominantly have lower tax rates while for abnormal discretionary expenses and abnormal cash flows, firms with negative residuals also have lower tax rates. The implication could be that these firms with lower tax rates have greater freedom to use REM as their shareholders would be opposed to increased tax if it is not commensurate to profits and dividends. They could also be of the view that the augmented tax obligation could have been used to purchase or secure other investments. The results are much more conclusive for FTSE 250 firms as shown by the median values. I provide the results for the three REM methods and include the average results.

Table 22**: Positive vs Negative Residuals REM for Average for abnormal production costs**

REM ABN PROD	POSITIVE	NEGATIVE		POSITIVE	NEGATIVE		POSITIVE	NEGATIVE	
AVERAGE	FTSE 100	FTSE 100	DIFFERENCE	FTSE 250	FTSE 250	DIFFERENCE	FTSE SMALL CAP	FTSE SMALL CAP	DIFFERENCE
2004	**21%**	**27%**	-6%	**27%**	**20%**	8%	14%	**27%**	-14%
2005	**24%**	**30%**	-6%	**27%**	**31%**	-4%	**23%**	**27%**	-5%
2006	**0%**	**32%**	-32%	**27%**	**29%**	-2%	**19%**	**35%**	-16%
2007	**16%**	**26%**	-10%	**15%**	**34%**	-19%	**20%**	**35%**	-15%
2008	**26%**	**45%**	-19%	**24%**	**26%**	-2%	**20%**	**38%**	-17%
2009	**51%**	**31%**	20%	**41%**	**18%**	23%	**27%**	**13%**	14%
2010	**23%**	**40%**	-17%	**15%**	**29%**	-15%	**25%**	**19%**	6%
2011	**18%**	**22%**	-4%	**11%**	**29%**	-18%	**19%**	**21%**	-2%
2012	**17%**	**25%**	-8%	**20%**	**18%**	2%	**16%**	**23%**	-7%
2013	**15%**	**28%**	-12%	**26%**	**52%**	-26%	**17%**	**17%**	0%
2014	**14%**	**23%**	-9%	**14%**	**29%**	-16%	**11%**	**24%**	-13%
2015	**19%**	**23%**	-4%	**21%**	**32%**	-10%	**10%**	**25%**	-15%
2016	**13%**	**26%**	-13%	**18%**	**26%**	-9%	**19%**	**11%**	8%
2017	**11%**	**23%**	-13%	**11%**	**16%**	-5%	**11%**	**18%**	-6%
2018	**18%**	**20%**	-2%	**23%**	**24%**	-1%	**14%**	**25%**	-11%

Table 23: **Positive vs Negative Residuals REM for Average for Abnormal Cash Flows**

REM ABN CASH FLOW	POSITIVE	NEGATIVE		POSITIVE	NEGATIVE		POSITIVE	NEGATIVE	
AVERAGE	FTSE 100	FTSE 100	DIFFERENCE	FTSE 250	FTSE 250	DIFFERENCE	FTSE SMALL CAP	FTSE SMALL CAP	DIFFERENCE
2004	19%	28%	-8%	20%	25%	-5%	25%	19%	6%
2005	25%	31%	-6%	30%	23%	6%	22%	21%	1%
2006	0%	30%	-30%	25%	27%	-2%	49%	12%	37%
2007	26%	19%	6%	32%	13%	19%	21%	34%	-13%
2008	52%	31%	21%	27%	20%	7%	19%	18%	1%
2009	43%	38%	4%	30%	25%	5%	11%	17%	-5%
2010	38%	23%	15%	20%	16%	4%	33%	12%	21%
2011	23%	14%	9%	23%	11%	12%	31%	39%	-7%
2012	26%	17%	9%	23%	18%	5%	20%	20%	0%
2013	27%	22%	5%	50%	26%	24%	20%	31%	-10%
2014	20%	26%	-6%	22%	14%	8%	16%	14%	2%
2015	20%	11%	8%	34%	10%	24%	15%	14%	2%
2016	21%	22%	-1%	21%	17%	5%	10%	17%	-7%
2017	19%	14%	5%	15%	9%	6%	16%	28%	-11%
2018	21%	27%	-6%	29%	9%	20%	17%	17%	0%

Table 24: **Positive vs Negative Residuals Average for Abnormal Discretionary Expenses**

REM ABN DISCRETIONARY EXPENSES	POSITIVE	NEGATIVE		POSITIVE	NEGATIVE		POSITIVE	NEGATIVE	
AVERAGE	FTSE 100	FTSE 100	DIFFERENCE	FTSE 250	FTSE 250	DIFFERENCE	FTSE SMALL CAP	FTSE SMALL CAP	DIFFERENCE
2004	28%	22%	6%	22%	27%	-5%	22%	24%	-2%
2005	33%	26%	8%	29%	26%	4%	16%	25%	-9%
2006	28%	32%	-4%	29%	26%	3%	19%	24%	-5%
2007	27%	18%	9%	25%	21%	4%	30%	28%	2%
2008	44%	25%	19%	32%	20%	12%	36%	15%	21%
2009	31%	44%	-13%	0%	27%	-27%	17%	20%	-3%
2010	29%	28%	0%	29%	16%	13%	18%	19%	-1%
2011	24%	18%	6%	23%	16%	7%	23%	19%	5%
2012	19%	25%	-6%	19%	14%	4%	20%	21%	-1%
2013	20%	26%	-6%	21%	32%	-11%	22%	13%	9%
2014	25%	24%	2%	22%	18%	4%	25%	11%	14%
2015	23%	16%	7%	20%	25%	-5%	13%	11%	2%
2016	26%	19%	7%	16%	19%	-3%	14%	13%	1%
2017	22%	22%	0%	16%	12%	5%	19%	12%	8%
2018	15%	29%	-14%	15%	22%	-7%	20%	11%	10%

These REM results do provide an observation that firms that are faring financially inferior than their peers in terms of several metrics such as interest cover and bankruptcy levels result in REM as a means to prop up earnings so as to show that they are still performing much better. These results are also consistent during the financial crisis years 2007-2008. The results for these REM characteristics when separating the positive and negative residuals are steady for all the metrics that is the median and average values for firms with poorer characteristics as compared to their peers exhibit a greater use of REM for the three REM methods that is abnormal production costs, cash flow and discretionary expenses and also observed to be the same for the three indices that is FTSE 100, FTSE 250 and FTSE Small Cap. I discuss further the financial crisis results and the multiple regressions vis-à-vis which characteristics for AEM and REM are significant. The difference between the two that is separating the positive and negative residuals for AEM and REM as compared to their least regression results is that the former method compares whether firms with inferior ratios have a greater propensity for EM whereas the latter technique investigates which characteristics are significant in their relationship to the two EM methods.

4.3 FINANCIAL CRISIS AND EARNINGS MANAGEMENT RESULTS

This paper's intention is to investigate the use of both EM methods that is AEM and REM during the financial crisis. It is useful to discuss these results with a specific emphasis on the financial crisis period as it is the central subject of this research hence it warrants a specific focus together with its inferences to establish and affirm the achievement of the overall purposes of the thesis. For this, I use the multivariate as the basis to conclude on the use of EM during the financial crisis. Thereafter I use the correlation and two-stage least squares for robustness checks that enable this paper to provide further evidence that the regression results are acceptable. The AEM results when using both the Jones and Modified Joes model show that there is a significant relationship between the FTSE 100 positive and negative residuals and the financial crisis period. The results for the time trend analysis show that FTSE 100 firms for both positive and negative residuals have a significant relationship with the financial crisis period for both of these AEM methods. The FTSE 250 results for the Jones and modified Jones model are not as conclusive while the FTSE Small Cap negative residuals that show a decline use of AEM have a significant relationship with the financial crisis. However, for the FTSE 250 when using the modified Jones model, the results show that there is a significant relationship with positive residuals (increased AEM) with time but not necessarily the financial crisis period.

This could then mean that there are other periods when the FTSE 250 firms have a significant relationship with the increased AEM models but this should not be construed to mean that it also applies to the financial crisis period. The anticipation as per the hypothesis would be that medium-sized firms would have a greater compelling reason to use AEM as compared to small and large firms, the reason being that these firms are at the growth phase hence their shareholders and investors would expect them to weather the financial crisis storm and be ready to take off when this period is over. The regression results however do not confirm this premise, I do not observe a significant relationship between the residuals and the financial crisis period for the FTSE 250 firms. I provide the AEM results below for the Jones model for both the positive and negative residuals for the three indices. The results for AEM and REM are consistent with other papers that

show firms will segue between the two forms of EM depending on the motivations at play. For example, Chan et al (2014) find that finds with high institutional shareholders will seek to avoid claw backs when investors find that the financial results are augmented by AEM, they will then use REM. They state that '' we find the co-efficient of post claw back is significant, suggesting that claw back adopters with high transient institutional ownership engage less in positive accruals management, while they switch to real activities management''. The same is evidenced in this paper for large (FTSE 100) firms.

The results portend several ramifications for the social, economic, and regulatory environment. The social impact of the financial crisis has been widely documented. The deep declining liquidity and failure of banks resulted in the foreclosure of mortgages not just in the US but in countries over the world. Subsequent to the mortgage crisis was the collapse of several companies that resulted in loss of jobs. As discussed in the introduction section the governments of countries had to intervene to stabilize not only the financial system but to restore firm's financial operations and individual financial standing. This comes at a cost to the taxpayers. Bebchuk (2009) notes that the government's involvement or intervention is at the public expense as taxes are used to stabilize banks and restore the financial system. Gorton et al (2004) also observe that one fundamental reason of government involvement is due to the inordinate assets size that private markets are unable to absorb. The size of the failure of banks and the financial system occasioned the governments input through injection of cash into the system. Brei et al (2013) note that one of the reasons for the cash was to restore bank capitalization levels. The social impact of the financial crisis through the use of taxes, families losing their homes, and staff lay-offs in companies has been widely documented. I, therefore, focus in this segment on the social impact of this thesis results as well as the economic and regulatory ramifications.

The use of REM by firms to avoid AEM due to the improved regulatory architecture at this time has several ramifications. One social impact of this is that it provides ideas for improvement of risk assessment of firms during this time. The risk of firms may have different rates pre, during and post the financial crisis period. Bouslah et al (2018) note that the social performance and risks are different in the financial crisis period. They observe that the social performance of firms and their relationship with risk varies over several periods. The correlation is different in the pre and post-financial crisis period, this is also dependent on the market conditions. Otker- Robe et al (2013) state that the financial crisis ''underscores the importance of systematic, proactive and integrated risk management by individuals, societies, and governments to prepare for adverse consequences''. The results show that firms various forms of REM during the financial crisis, this can be included in the risk assessment of firms at this period. A closer examination of abnormal production costs such as movement of inventory or abnormal discretionary expenses such as decline in marketing or research and development spend during this time could signal a form of EM.

A decline in spending on discretionary items could affect other firms that rely on this such as advertising or research and development if outsourced or even in the firm's internal departments. It could lead to the loss of jobs for these companies or departments. This thesis could aid in government policy such as tax spend or tax threshold evaluation of firms or industries during the

financial crisis. Reinhart and Rogoff (2009) note that the financial crisis has the social impact on countries such as government debt. These taxes if not spent in the right way could lead to a decline in social and human well-being. Thus tax spend or tax cuts if not decided to assist the correct firms and industries could have a negative impact on the population's human and social well-being. The government should divert that taxation or government debt to areas of health, education or unemployment during this time rather than areas that decline due to EM. Baumbach and Gulis (2014) state that ''a number of health outcomes were affected by the previous financial crisis e.g suicides, homicides and transport accident mortality''. The government therefore would need to divert funds to this health concerns rather areas such as research and development which decline through EM and not a firms normal activities.

The thesis also has economic ramifications. The impact of the financial crisis on countries GDP and decline in other economic metrics. Reinhart and Rogoff (2009) examine the impact of the financial crisis on the economy. They observe the impact the financial crisis has on housing and stock prices, unemployment, government debt, and output. The economic impact of the financial crisis can be viewed in two ways. Firstly there is the decline in the nature of global activity (Borio and Disyatat, 2010), and second is the nature of the sequence of events that began in the US and then spread to other countries (Miles-Ferretti and Tille, 2011). This thesis shows that firms use REM to show that they are still strong during the financial crisis and therefore obtain new funds or retain their loan or debt covenants at the same level and also avoid further restrictions on their debt. These firms are deemed to be able to come out of the financial crisis quicker than their peers and are therefore in a better position to obtain funds. This form of EM has an economic ramification. As discussed in the introduction, Fazzari et al (1988) note that healthy firms are able to obtain funds better than their peers during a crisis period. The impact of this is that firms may use EM through REM to obtain funds and therefore decline the facilities available to other firms. Block et al (2010) note that small firms had already drawn down their facilities. This thesis shows that there is a decline in AEM for these firms however they still use REM. They would therefore be able to maintain their debt covenants at the preferable position. Ivashina and Scharfstein (2010) find that during the financial crisis, there is a reduction in new loans. An economic ramification of the results of this thesis is that the use of REM diverts funds or loans to firms that may not be eligible while at the same time inhibiting other qualified firms from these loans. These firms would have spurred the economy through job creation and increased tax spending to the government. It is therefore important for funders such as banks to also consider REM in their risk assessment of firms during this time so as to provide loans to productive companies.

A final ramification of this thesis is the regulatory aspect. As already discussed, there is a social and economic impact of the results of this results. There is therefore a need to consider the legislation and whether amendments would make firms and managers eschew or avoid the use of these forms of EM. Several papers have discussed on the regulations that have been reviewed post the financial crisis. Goodhart (2008) notes that there are seven aspects of financial regulation that came into focus. These are scale and scope of deposit insurance, bank solvency regime, money market operations, commercial bank liquidity risk management, pro-cyclicality of capital adequacy requirements, boundary regulation, conduits, special vehicles, and reputational risk and crisis management. Moshirian (2011) observes that the global financial crisis provides

governments and regulators an opportunity to obtain cross-border financial and economic data that could assist them in managing risk more effectively. This paper has already discussed the financial reporting such as IFRS 10 and IFRS 12 post the financial crisis. Ipino and Parbonetti (2017) find an increase in the use of REM when IFRS standards are introduced or implemented. However these results show that firms will use REM as opposed to AEM therefore the regulation provides a disincentive for firms to use AEM, therefore REM becomes appealing.

On the other hand, REM is under the management's purview which makes it difficult to regulate. There are other safeguards that financial institutions and shareholders can institute to avoid the use of REM which also negatively affects the firm's long-term value. Lo (2009) notes that in a financial crisis where human behavior through fear and greed or animal spirits are involved and combined with free enterprise then legislation and regulation may not deal with this. However other measures and adaptive regulation can be introduced. These include financial literacy from schools to universities, certification for experts in risk management and financial engineering and finally directors and senior management, especially for financial institutions. This thesis and the results underscore the need for such malleable and ductile actions that increase awareness in the society so as to deter the use of REM which will be punished by the market and lenders as they would divert funds from firms who use REM to augment performance. Therefore despite REM not being legislated against, there are other safeguards that can be implemented to dissuade its use.
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The REM results for the regressions are mixed. There is evidence of the use of the REM methods for abnormal production costs, abnormal cash flows, and abnormal discretionary expenses for the FTSE 100. FTSE 250 and FTSE Small Cap. However, there is no significant evidence that reveals a uniform substitution effect for all the three REM methods however each has a specific switching outcome depending on the size of the indices. For example, FTSE 100 has a significant relationship with AEM for the financial crisis. The negative residuals (decline) AEM also has a significant relationship with abnormal cash flows which has a positive coefficient. The positive residuals (increased) AEM has a significant relationship with the three REM methods. The abnormal production costs and abnormal discretionary expenses have negative coefficients while abnormal cash flow has a positive coefficient. I then try to obtain evidence for the other two indices. From the multiple regression, the FTSE 250 firms do not have a significant relationship with the financial crisis period. The FTSE 250 firms do not show a significant relationship with the positive residuals for AEM or positive residuals with REM abnormal production costs or negative cash flows. However, there is a significant relationship between the negative residuals (increased) discretionary expenses and the financial crisis period. This provides evidence of the use of REM by FTSE 250 firms during the financial crisis period. For the FTSE Small Cap, there is a significant relationship with the negative residuals (decline) AEM. Conversely, there is a significant relationship between negative residuals (increased) abnormal discretionary expenses and the financial crisis period. Thus this is the method of EM preferred by small firms.

For the variables, the results when separating the positive and negative residuals show that firms that have poorer financial numbers such as Altman Z-score bankruptcy levels and tax rates have an increasing rate of using REM as compared to their better-performing counterparts. This is also

evidenced to be the case during the financial crisis period. For the regressions, the results for the FTSE 100 for REM show that for these firms there is a significant relationship between the Altman Z-score with the abnormal production costs which is the means of REM preferred by these large firms. However, there is no significant relationship with tax rate and the positive abnormal production costs residuals. Additionally for all three indices, there is no evidence that tax rate as a variable is significant. Thus there is no significant relationship for both the positive and negative residual for any of the three REM methods that is abnormal production costs, abnormal cash flow, and abnormal discretionary expenses. The results for risk of bankruptcy when this variable is included in the multiple regression show that for FTSE 100 and FTSE 250 there is a significant relationship with a positive residual (that is increased) abnormal production costs for these two indices firms. For FTSE 100 and FTSE 250 firms, there is also a significant relationship with the risk of bankruptcy that the negative residuals which is increased use of both abnormal cash flows and discretionary expenses. For FTSE Small Cap the results do not show a significant relationship with positive residuals (increased) abnormal production costs or negative (increased) abnormal cash flows. However, there is a significant relationship of FTSE Small cap firms with the risk of bankruptcy and negative residuals (increased) abnormal discretionary expenses which is the means preferred by these firms in REM during the financial crisis period. Therefore there is evidence that the risk of bankruptcy has a significant relationship with all the three indices as pertains to the preferred REM method which is abnormal production costs for FTSE 100 and abnormal discretionary expenses for FTSE 250 and FTSE Small Cap. I provide the results for these three regressions results.

Prior literature finds that firms use REM to show that their firms are still strong and therefore have better prospects as compared to their peers. Gunny (2005) finds that managers may turn to REM when AEM is hindered in order to signal to the shareholders of their ability to achieve future positive performance. The increased regulation during the financial crisis made REM more appealing. Ipino and Parbonetti (2017) state that '' accounting regulators' efforts to increase earnings quality might have had the unintended consequence of increasing real earnings management activities". They find that the implementation of IFRS in European countries provided incentives for firm to use REM. These firms have a high level of market scrutiny and need for transparency. Prior literature also find that in the use of REM then discretionary expenses is one that is often preferred by managers. One reason for this is that it has a lower cost to the firm. Other forms of REM such as price discounts or overproduction could be expensive for firms and at the same time lower profit margins. Graham et al (2005) observe that the use of abnormal discretionary expenses is widespread. Managers would reduce the amount spent on discretionary expenses when they need to boost earnings. Li (2019) states that the use in reduction of abnormal discretionary expenses provides managers with a clean way to use EM. This thesis can be viewed in two steps. Firstly, when there is a restriction or an increased regulation then firms will use REM as compared to AEM. Secondly when deciding which form of REM to use then most firms such as medium and small firms use to lower spend on discretionary expenses as it is less costly while large firms that have more financial resources can use other firms such as price discounts or overproduction.

The results also provide evidence that supports the theoretical framework. The economic theory of demand and supply is confirmed during the financial crisis when there is a deep declining liquidity such as bank loans (Hogan, 2019) and Acharya and Mora (2015), firms need to show that they have sound financial statements so as to attract bank loans or avoid restriction on their debt covenants. Furthermore there is adverse selection during this time with asymmetry of information hence funds are provided to activities or output that have lower returns than other better investment opportunities (Mishkin, 1992). The results show that firms with poorer financial ratios use REM. The firms avoid the use of AEM which investors as this can be detected by investors such as institutional shareholders or banks that offer loans. The screening effect at this time which results in credit rationing or equilibrium rationing provides an incentive for firms to use EM. Stiglitz and Weiss (1981) and King (1986) both elucidate that in a credit or equilibrium rationing period then the lenders will require a certain rate of return that is not monotonically to interest rate. Thus in a financial crisis period when there is a decline in lending then firms will seek to avoid restrictions on their debt covenants or increased constraints by funders Thus when AEM is restricted during the financial crisis for example due to improved regulations they use REM.

Watts and Zimmerman (1986) observe that firms with tight restrictions are therefore more likely to use EM as compared to those with greater freedom. The reason is that these firms will seek to avoid a possible breach of future debt covenants. Other papers also find that a violation of debt covenants results in a firm being placed in a negative position by lenders with the effect that they will incur a greater rate of return for capital. Chava and Roberts, (2008) and Roberts and Sufi, (2009) observe that firms that are found to have debt violations will have reduction investment opportunities as they will face a higher cost of capital. The firms will therefore seek to renegotiate their debt covenants with the lender so as to avoid disclosing this in their financial statements which would result in negative repercussions. Debt covenant violations are a signal to the market and other stakeholders of the potential future debt distress. Roberts and Sufi (2009) find that technical defaults or debt covenant violations are a strong signal or prediction of strict lending conditions for firms to obtain further loan applications. This could be either through a reduction in the loan requested or an increase in the interest rate. Firms therefore use EM to avoid these restrictions. As discussed in the hypothesis section, this thesis predicts that firms would have an incentive to use either AEM or REM depending on their characteristics. Whereas Defond and Jiambalvo (1994) find that firms with increased leverage will use AEM so as to avoid the negative impact on their debt covenants. This thesis hypothesizes that the lenders would be aware of this thus they will be in a position to detect it. The thesis therefore investigates both AEM and REM. The results support the use of REM and that the form of REM is dependent on the size of the firm. A reason for departure from AEM during the financial crisis is the improved regulatory architecture that inhibits the use of AEM. Another reason is a significant proportion of institutional shareholders for large firms or qualified personal banks by small firms as well as quality auditors that deter the use of AEM at this time.

This paper already discussed the separation of the positive and negative residuals for the AEM and REM vis-à-vis the interest cover and working capital ratios. However, for the multiple regression, the financial ratios as variables provide us with a deeper understanding of the financial constraints that impact the firm's use of EM. For firms, the multiple regressions show that there is a significant

relationship of risk of bankruptcy for all three indices with their constituent financial crisis REM methods that is abnormal production costs for FTSE 100 and abnormal discretionary expenses for FTSE 250 and FTSE Small Cap. The other financial ratios are diverse For example for FTSE 100, in addition to the risk of bankruptcy there is also a significant relationship with the quick ratio and working capital with the positive residual for abnormal production costs which is also significant with the financial crisis. For the FTSE 250, there is a significant relationship between the negative residual for the abnormal discretionary expenses with the financial crisis for which there is also a significant relationship between the quick ratio and working capital as well as the level of bankruptcy as already mentioned. For FTSE Small Cap there is a significant relationship between the abnormal discretionary expenses and the financial crisis and the debt ratio which is ratio of total liabilities to total assets as well as the risk of bankruptcy as already pointed out. These multiple regression results provide us with the equations of the firms that will use either form of EM during the financial crisis. This then affords us with the response as to whether firms use EM during the financial crisis, which form of EM is preferred and what are the characteristics significant in the relationship.

4.4 MULTICOLLINEARITY AND CORRELATION

In this section, I discuss the results and their robustness in terms of correlation and two-staged least squares that provide us with a greater degree of confidence in the reliability and soundness of the data and the ensuing results. As already discussed, I use correlation tests. For multi-collinearity, I used a Variable Inflation Factor (VIF) to test for evidence. The normal values for AEM that is total accruals and for REM that is normal production costs, normal cash flows, and normal discretionary expenses have a correlation of one with the components of their respective formulas such as property plant and equipment and change in revenue for AEM and the respective formula inputs for the three REM methods as already discussed in the methodology. The paper includes a correlation that also provides evidence of the substitution of the AEM and REM. Cohen et al (2008) also use correlation to provide evidence for the substitution of AEM and REM. They state that ‘’ The correlation among accrual-based and real earnings management are consistent with a substitution effect, the study finds a negative relation between discretionary accruals and the real earnings management metrics, suggesting that firms are prone to substituting between these two earnings management methods. Further, the three real earnings management variables are also negatively correlated, indicating that firms switch between real earnings management methods’’.

This paper also follows the same methodology and runs the correlation that shows the negative correlation between AEM and REM as well as between the specific three REM methods. The tables that are shown below provide this evidence which supports the presence of substitution that depends on the size of the firm. This is also contingent on the nature of AEM and REM used by these firms. An example is the negative correlation between the positive abnormal production costs residuals for the FTSE 100 firms and the discretionary accruals, abnormal cash flows, and abnormal discretionary expenses as shown for the AEM negative (declining) residuals. These results provide evidence of the robust results that support the regressions methods already discussed. The correlation results support the substitution of the two as evidenced by the negative

coefficient between the two methods in the multiple regressions. For REM, the FTSE 250 and FTSE Small Cap firms also show a negative correlation between the negative (increasing) abnormal discretionary expenses and the discretionary accruals. This further supports the substitution effect between these firms with REM discretionary expenses which as already noted is the method used by these firms during the financial crisis period. I provide the results for the positive and negative residuals for AEM and REM. I also include the results for the variable inflation factors (VIF) for AEM in the tables below. For VIF, the variables equivalent to one are not correlated for between one and five the variables are moderately correlated, and finally above five the variables are highly correlated. For any value above ten indicates multicollinearity that needs to be adjusted. The results do not show VIF above ten for fundamental variables such as AEM, REM, time or financial crisis, however, this is for one or two financial variables which are then excluded for reporting. The same is observed for REM results which are in the appendix from XCIX to CIV.

Table 25**: Correlation for AEM Positive Residuals**

	Correlation for AEM JONES Positive Residuals				
		D.ACCR	**A. PROD**	**A. C. FLOWS**	**A.D. EXPEN**
	D.ACCR	1	-0.095	.270**	-0.046
	P-value		0.071	0.000	0.384
	N	366	366	366	366
	A. PROD	-0.095	1	.228**	-.181**
	P-value	0.071		0.000	0.001
	N	366	366	366	366
	A. C. FLOWS	.270**	.228**	1	.218**
	P-value	0.000	0.000		0.000
	N	366	366	366	366
	A.D. EXPEN	-0.046	-.181**	.218**	1
	P-value	0.384	0.001	0.000	
FTSE100+VE	*N*	366	366	366	366
		D.ACCR	**A. PROD**	**A. C. FLOWS**	**A.D. EXPEN**
	D.ACCR	1	0.026	0.007	-0.022
	P-value		0.447	0.824	0.507
	N	884	884	884	884
	A. PROD	0.026	1	-.255**	-.245**
	P-value	0.447		0.000	0.000
	N	884	884	884	884
	A. C. FLOWS	0.007	-.255**	1	.135**
	P-value	0.824	0.000		0.000
	N	884	884	884	884
	A.D. EXPEN	-0.022	-.245**	.135**	1
	P-value	0.507	0.000	0.000	
FTSE250+VE	*N*	884	884	884	884
		D.ACCR	**A. PROD**	**A. C. FLOWS**	**A.D. EXPEN**
	D.ACCR	1	0.017	-.135**	-0.024
	P-value		0.664	0.001	0.534
	N	656	656	656	656
	A. PROD	0.017	1	-.376**	-.314**
	P-value	0.664		0.000	0.000
	N	656	656	656	656
FTSE SMALL CAPS	**A. C. FLOWS**	-.135**	-.376**	1	-.114**

	P-value	0.001	0.000		0.004
	N	656	656	656	656
	A.D. EXPEN	-0.024	-.314**	-.114**	1
	P-value	0.534	0.000	0.004	
	N	656	656	656	656
	** Correlation is significant at the 0.01 level (2-tailed).				

Table 26**: Correlation for AEM Negatives Residuals**

	Correlation for AEM JONES Negative Residuals				
		D.ACCR	**A. PROD**	**A. C. FLOWS**	**A.D. EXPEN**
	D.ACCR	1	-0.027	-0.017	-0.083
	P-value		0.546	0.697	0.061
	N	509	509	509	509
	A. PROD	-0.027	1	0.021	-.306**
	P-value	0.546		0.637	0.000
	N	509	509	509	509
	A. C. FLOWS	-0.017	0.021	1	.119**
	P-value	0.697	0.637		0.007
	N	509	509	509	509
	A.D. EXPEN	-0.083	-.306**	.119**	1
	P-value	0.061	0.000	0.007	
FTSE100-VE	*N*	509	509	509	509
		D.ACCR	**A. PROD**	**A. C. FLOWS**	**A.D. EXPEN**
	D.ACCR	1	0.037	-0.052	0.015
	P-value		0.220	0.086	0.611
	N	1095	1095	1095	1095
	A. PROD	0.037	1	-.318**	-.198**
	P-value	0.22		0.000	0.000
	N	1095	1095	1095	1095
	A. C. FLOWS	-0.052	-.318**	1	.214**
	P-value	0.086	0.000		0.000
	N	1095	1095	1095	1095
	A.D. EXPEN	0.015	-.198**	.214**	1
	P-value	0.611	0.000	0.000	
FTSE250-VE	*N*	1095	1095	1095	1095
		D.ACCR	**A. PROD**	**A. C. FLOWS**	**A.D. EXPEN**
	D.ACCR	1	0.059	0.025	-.120**
	P-value		0.099	0.486	0.001
	N	776	776	776	776
	A. PROD	0.059	1	-.418**	-.448**
	P-value	0.099		0.000	0.000
	N	776	776	776	776
	A. C. FLOWS	0.025	-.418**	1	.215**
	P-value	0.486	0.000		0.000
	N	776	776	776	776
	A.D. EXPEN	-.120**	-.448**	.215**	1
	P-value	0.001	0.000	0.000	
FTSE SMALL CAPS	*N*	776	776	776	776
** Correlation is significant at the 0.01 level (2-tailed).					

Table 27**: REM CORRELATIONS for Negative Residuals**

Correlation for REM Discretionary Expenses Negative residuals					
		A. C. FLOWS	**D.ACCR**	**A. PROD**	**A.D. EXPEN**
	A. C. FLOWS	1	0.041	.576**	0.068
	P-value		0.418	0.000	0.184
	N	385	385	385	385
	D.ACCR	0.041	1	-0.048	-0.027
	P-value	0.418		0.352	0.597
	N	385	385	385	385
	A. PROD	.576**	-0.048	1	-.129*
	P-value	0.000	0.352		0.011
	N	385	385	385	385
	A.D. EXPEN	0.068	-0.027	-.129*	1
	P-value	0.184	0.597	0.011	
FTSE100-VE	*N*	385	385	385	385
		A. C. FLOWS	**D.ACCR**	**A. PROD**	**A.D. EXPEN**
	A. C. FLOWS	1	-.253**	-.353**	.147**
	P-value		0.000	0.000	0.000
	N	857	857	857	857
	D.ACCR	-.253**	1	.089**	-0.032
	P-value	0.000		0.009	0.354
	N	857	857	857	857
	A. PROD	-.353**	.089**	1	-.145**
	P-value	0.000	0.009		0.000
	N	857	857	857	857
	A.D. EXPEN	.147**	-0.032	-.145**	1
	P-value	0.000	0.354	0.000	
FTSE250-VE	*N*	857	857	857	857
		A. C. FLOWS	**D.ACCR**	**A. PROD**	**A.D. EXPEN**
	A. C. FLOWS	1	-.212**	-.244**	-0.072
	P-value		0.000	0.000	0.121
	N	469	469	469	469
	D.ACCR	-.212**	1	.103*	-.123**
	P-value	0.000		0.025	0.008
	N	469	469	469	469
	A. PROD	-.244**	.103*	1	-.419**
	P-value	0.000	0.025		0.000
	N	469	469	469	469
	A.D. EXPEN	-0.072	-.123**	-.419**	1
FTSE SMALL CAPS – VE	*P-value*	0.121	0.008	0.000	
	N	469	469	469	469
** Correlation is significant at the 0.01 level (2-tailed).					

Table 28**: REM CORRELATIONS for Positive Residuals**

Correlation for REM Abnormal Production Positive Residuals					
		A. C. FLOWS	**D.ACCR**	**A. PROD**	**A.D. EXPEN**
FTSE100+VE	**A. C. FLOWS**	1	0.003	-.534**	-.315**
	P-value		0.958	0.000	0.000
	N	399	399	399	399
	D.ACCR	0.003	1	.160**	0.019
	P-value	0.958		0.001	0.700
	N	399	399	399	399
	A. PROD	-.534**	.160**	1	0.038
	P-value	0.000	0.001		0.446
	N	399	399	399	399
	A.D. EXPEN	-.315**	0.019	0.038	1
	P-value	0.000	0.700	0.446	
	N	399	399	399	399
FTSE250+VE		**A. C. FLOWS**	**D.ACCR**	**A. PROD**	**A.D. EXPEN**
	A. C. FLOWS	1	.101**	-.363**	-.070*
	P-value		0.002	0.000	0.032
	N	924	924	924	924
	D.ACCR	.101**	1	-.306**	-0.057
	P-value	0.002		0.000	0.084
	N	924	924	924	924
	A. PROD	-.363**	-.306**	1	.143**
	P-value	0.000	0.000		0.000
	N	924	924	924	924
	A.D. EXPEN	-.070*	-0.057	.143**	1
	P-value	0.032	0.084	0.000	
	N	924	924	924	924
FTSE SMALL CAPS +VE		**A. C. FLOWS**	**D.ACCR**	**A. PROD**	**A.D. EXPEN**
	A. C. FLOWS	1	.118**	-.295**	-.505**
	P-value		0.006	0.000	0.000
	N	538	538	538	538
	D.ACCR	.118**	1	-.173**	-0.050
	P-value	0.006		0.000	0.243
	N	538	538	538	538
	A. PROD	-.295**	-.173**	1	.132**
	P-value	0.000	0.000		0.002
	N	538	538	538	538
	A.D. EXPEN	-.505**	-0.05	.132**	1
	P-value	0.000	0.243	0.002	
	N	538	538	538	538
** Correlation is significant at the 0.01 level (2-tailed).					

Table 29: AEM FTSE 100 Multiple Regression Variation Inflation Factors

AEM FTSE 100 Collinearity Statistics					
FTSE 100 +VE	**B**	**T**	**P-value**	**Tolerance**	**VIF**
(Constant)	0.196	0.346	0.730		
ABNORMAL PRODUCTION	-2.348	-4.455	0.000	0.754	1.326
ABNORMAL CASH FLOWS	15.225	6.599	0.000	0.787	1.271
ABNORMAL DISCRETIONARY EXPENSES	-3.37	-2.417	0.016	0.861	1.161
Time	-0.007	-0.148	0.882	0.805	1.243
Financial crisis	3.068	3.832	0.000	0.864	1.158
Change in GDP	-0.09	-0.854	0.394	0.943	1.061
Return in equity	-0.517	-1.463	0.144	0.621	1.611
Net operating assets	-3.70E-09	-0.812	0.417	0.946	1.057
Operating cycle	-2.96E-05	-0.052	0.959	0.801	1.249
Debt ratio	2.67E-05	0.395	0.693	0.947	1.056
Debt to EBITDA	0.077	1.024	0.306	0.853	1.173
Debt to Equity	0.05	0.859	0.391	0.633	1.58
Quick ratio	-0.26	-0.638	0.524	0.43	2.328
Times interest earned	-0.001	-0.563	0.574	0.889	1.125
Working capital	0.069	0.214	0.830	0.403	2.48
AEM FTSE 100 –VE	**B**	**T**	**p-value**	**Tolerance**	**VIF**
(Constant)	-0.037	-0.933	0.351		
ABNORMAL PRODUCTION	-0.053	-0.9	0.369	0.812	1.231
ABNORMAL CASH FLOWS	0.503	2.49	0.013	0.929	1.077
ABNORMAL DISCRETIONARY EXPENSES	0.023	0.224	0.823	0.856	1.168
Time	-0.004	-1.211	0.226	0.801	1.249
Financial crisis	-0.668	-16.845	0.000	0.79	1.266
Change in GDP	0.028	4.496	0.000	0.908	1.102
Return in equity	0.014	1.084	0.279	0.115	8.68
Net operating assets	9.96E-10	1.861	0.063	0.945	1.059
Operating cycle	-5.37E-05	-0.839	0.402	0.825	1.212
Debt Ratio	1.11E-05	0.92	0.358	0.870	1.15
Debt to EBITDA	-9.29E-05	-0.072	0.942	0.967	1.034
Debt to Equity	-0.001	-0.393	0.694	0.115	8.718
Quick ratio	0.076	1.967	0.050	0.327	3.055
Times interest earned	0.000	-30.757	0.000	0.963	1.038
Working capital	-0.049	-1.564	0.119	0.307	3.254

Table 30: AEM FTSE 250 Multiple Regression Variation Inflation Factors

AEM FTSE 250 +VE	B	T	p-value	Tolerance	VIF
(Constant)	0.056	7.025	0.000		
ABNORMAL PRODUCTION	0.016	1.844	0.066	0.725	1.379
ABNORMAL CASH FLOWS	-0.064	-2.273	0.023	0.741	1.349
ABNORMAL DISCRETIONARY EXPENSES	-0.013	-0.685	0.493	0.919	1.088
Time	-0.003	-4.087	0.000	0.816	1.226
Financial crisis	-0.001	-0.156	0.876	0.832	1.201
Change in GDP	-0.001	-0.646	0.518	0.921	1.086
Return in equity	0.003	0.862	0.389	0.633	1.580
Net operating assets	0.000	-0.744	0.457	0.965	1.036
Operating cycle	0.000	-2.254	0.025	0.974	1.026
Debt ratio	0.000	2.726	0.007	0.897	1.115
Debt to EBITDA	0.000	1.506	0.133	0.981	1.019
Debt to Equity	0.000	-0.644	0.520	0.633	1.581
Quick ratio	-0.007	-1.519	0.129	0.410	2.437
Times interest earned	0.000	-1.079	0.281	0.944	1.060
Working capital	0.019	5.020	0.000	0.443	2.259
AEM FTSE 250-VE	**B**	**T**	**p-value**	**Tolerance**	**VIF**
(Constant)	-0.034	-1.904	0.057		
ABNORMAL PRODUCTION	0.010	0.431	0.666	0.840	1.191
ABNORMAL CASH FLOWS	-0.064	-0.849	0.396	0.888	1.126
ABNORMAL DISCRETIONARY EXPENSES	0.028	0.516	0.606	0.931	1.074
Time	0.001	0.342	0.733	0.847	1.180
Financial crisis	-0.009	-0.418	0.676	0.845	1.183
Change in GDP	0.003	0.888	0.375	0.927	1.078
Return in equity	-0.001	-0.334	0.739	0.074	13.594
Net operating assets	0.000	-17.981	0.000	0.957	1.045
Operating cycle	0.000	1.958	0.051	0.628	1.591
Debt ratio	0.000	0.596	0.552	0.538	1.858
Debt to EBITDA	0.000	0.117	0.907	0.965	1.036
Debt to Equity	0.000	0.344	0.731	0.074	13.565
Quick ratio	0.010	0.581	0.561	0.298	3.356
Times interest earned	0.000	-0.085	0.932	0.622	1.608
Working capital	-0.018	-1.301	0.193	0.258	3.881

Table 31: AEM FTSE SMALL CAPS Multiple Regression Variation Inflation Factors

AEM FTSE SMALL CAPS +VE	B		P	Tolerance	VIF
(Constant)	0.057	1.85	0.065		
ABNORMAL PRODUCTION	-0.107	-2.04	0.042	0.685	1.459
ABNORMAL CASH FLOWS	-0.357	-3.187	0.002	0.730	1.370
ABNORMAL DISCRETIONARY EXPENSES	-0.081	-1.696	0.091	0.687	1.456
Time	0.002	0.618	0.537	0.855	1.170
Financial crisis	0.01	0.282	0.778	0.875	1.143
Change in GDP	-0.006	-1.197	0.232	0.927	1.078
Return in equity	0.121	6.664	0.000	0.842	1.187
Net operating assets	-8.04E-10	-0.029	0.977	0.953	1.050
Operating cycle	-6.40E-05	-4.417	0.000	0.925	1.082
Debt ratio	-5.40E-07	-0.218	0.827	0.992	1.008
Debt to EBITDA	0.002	4.985	0.000	0.954	1.048
Debt to Equity	-0.024	-5.365	0.000	0.836	1.196
Quick ratio	0.022	0.711	0.477	0.126	7.927
Times interest earned	9.15E-06	0.219	0.827	0.918	1.089
Working capital	-0.016	-0.59	0.555	0.134	7.485
AEM FTSE SMALL CAPS –VE	B		P	Tolerance	VIF
(Constant)	-0.122	-8.178	0.000		
ABNORMAL PRODUCTION	0.005	0.209	0.834	0.640	1.563
ABNORMAL CASH FLOWS	0.1	1.676	0.094	0.704	1.421
ABNORMAL DISCRETIONARY EXPENSES	-0.103	-4.24	0.000	0.720	1.390
Time	0.003	2.508	0.012	0.816	1.225
Financial crisis	0.032	2.089	0.037	0.811	1.233
Change in GDP	0.004	1.679	0.094	0.913	1.095
Return in equity	0.003	1.406	0.160	0.808	1.238
Net operating assets	-1.20E-08	-0.594	0.552	0.922	1.084
Operating cycle	1.45E-06	0.133	0.894	0.564	1.774
Debt ratio	-2.31E-08	-0.013	0.990	0.986	1.014
Debt to EBITDA	8.99E-05	0.114	0.909	0.981	1.020
Debt to Equity	-0.001	-1.126	0.261	0.821	1.219
Quick ratio	-0.028	-1.452	0.147	0.096	10.389
Times interest earned	-2.11E-05	-0.791	0.429	0.916	1.092
Working capital	0.037	2.215	0.027	0.108	9.225

Dependent Variable: DISCRETIONARY ACCRUALS

4.5 ENDOGENEITY: TWO STAGE LEAST SQUARES

Badertscher (2011) states that ‘’endogenously determined variables can cause parameter estimates to be biased and inconsistent, which could cloud the interpretation of results’’. This paper undertakes a two-staged least squares to furthermore investigate the nature of endogeneity of the variables and attempt to observe these movements. The objective is to provide a further evidence of the robustness of the results. It is worth pointing out that the test for the endogeneity is not easy. One of the ways to do this is through the use of two stage least squares. Badertscher (2011) note that ‘’the standard econometric solution for endogeneity is to use a two stage least squares (2SLS) procedure that relies upon instrumental’’. In his paper, he uses endogeneity test in order to examine

the observation of whether EM could have led to overvaluation. This is contrary to the hypothesis of his paper which stated that overvaluation leads firms to use EM so as to maintain this valuation.

This paper also uses the two staged least squares to test for endogeneity. The regression are run on SPSS which involves including the dependent variable, explanatory variable and instrumental variable. For this paper the dependent variables will either be the AEM or REM depending on the nature of the test. The explanatory variable will be the vice versa so for example if AEM is the dependent variable then either of the three REM residuals will be the explanatory variable. Finally the instrumental variables will be the time, financial crisis, specific AEM and REM variables, general variables and financial ratios such as interest cover or working capital. This papers test for endogeneity follows the same approach as Badertscher (2011). He states that despite the difficulty in obtaining the appropriate instrumental variables it is still vital to control for endogeneity. He uses instrumental variables by selecting a set of variables that includes the " dependent variables from the three other questions, a set of instruments for the variable being modeled, and a common set of control variables''. The equations for this paper are.

$AEM_{i,j}$ =f (REM, instrumental variables);

$REM_{i,j}$ = f (AEM, instrumental variables);

The two stage least squares test for endogeneity as noted is important in order to test the relationship between the dependent and independent variables. The substitution of AEM and REM is important to examine whether these are used by firms inter-changeably. The endogenous elements also included as independent variables are the Y units in the regression that are tested for their relationship with the dependent variables (X units) also known as the exogenous. For the independent variables to be exchanged as dependent variables they need to impact each other equivalently. This is analogous to the relationship between demand and supply in economics which is a theoretical framework for this paper. In this case demand can be dependent and supply independent however in certain times this can be inter-changed with the vice versa that is supply being dependent and demand independent. This is accepted because both of the variable are impacted by price as an instrumental variable. For example a decline in price results in an increase in demand as well as supply. The opposite is also true. In this scenario the demand side (Dependent variable) is exogenous while the supply side (independent variable) is endogenous the price stands in as the instrument variable which links demand and supply. For this paper the two stage least square tests the AEM and REM models to observe the substitutability amongst these when the other variables are included as instrumental variables. The results for the significant relationship provide evidence when these associations can be inter-changed under the set out instrumental variables.

The results for the two staged least squares for this paper show that there is a significant relationship between AEM and REM and substitution between the discretionary accruals and respective REM models. For AEM I have used the residuals for the Jones results as the dependent variables and the three REM methods that is abnormal production costs, abnormal cash flows and abnormal discretionary expenses as the independent variables. The other variables are then included as instrumental variables. For example for the FTSE 100 there is a significant relationship

with the discretionary expenses for both the positive and negative AEM residuals. For FTSE 250 there is a significant relationship of the discretionary accruals with abnormal production costs for the positive AEM residuals and abnormal cash flows and abnormal discretionary expenses for the negative AEM residuals. For the FTSE Small Cap there is only a significant relationship between the discretionary accruals and abnormal production costs and abnormal discretionary expenses for the positive AEM residuals. These significant relationship for the AEM dependent variable and the three REM models provides evidence of the endogeneity and the impact of substitution between the Y and X that depends on the firm's size.

For REM the one of the three variables is the dependent variables while the other two are the independent variables as well as the discretionary accruals variables. The other variables such as the financial ratios are run as instrumental variables. For FTSE 100 there is a significant between the positive AEM residuals and the abnormal cash flows and the abnormal discretionary expenses. For the negative AEM residuals there is a significant relationship with the abnormal discretionary expenses. For FTSE 250 there is a significant relationship between positive AEM discretionary accruals and abnormal production costs. The same is noticed for AEM negative discretionary accruals with a significant relationship with the abnormal cash flows and abnormal discretionary expenses. For FTSE Small Cap there is a significant relationship between the AEM positive discretionary accruals residuals and the abnormal production costs and the abnormal cash flows, while for the negative residuals there is a significant relationship between the negative AEM discretionary accruals and the abnormal discretionary expenses. Additionally for the REM modules there is a significant relationship between the negative and positive residuals and the AEM discretionary accrual residuals as well as respective three REM models depending on the size. For example for the FTSE 100 and FTSE 250 positive residuals there is a significant relationship between the abnormal cash flows and abnormal production costs. I provide the results for the two stage least square

AEM Two Stage Least Square

Table 32: AEM Jones Positive Residuals

AEM +VE Jones		B	T	p-value	Model	ANOVA
FTSE100 +VE	(Constant)	0.486	2.017	0.044	R=0.136, R^2=0.018, Adj R^2=-0.010	F (5, 350) =2.179, p=0.088
	A. PROD	-0.386	-0.243	0.808		
	A. CASHFLOWS	18.122	1.833	0.068		
	A. D. EXPEN	-18.646	-2.227	0.027		
FTSE250+VE	(Constant)	0.080	12.373	0.000	R=0.140, R^2=0.020, Adj R^2=-0.016	F (5, 733) =4.920, p=0.002
	A. PROD	-0.100	-2.051	0.041		
	A. CASHFLOWS	0.100	0.679	0.498		
	A. D. EXPEN	-0.288	-1.623	0.105		
FTSE Small Caps +VE	(Constant)	0.140	3.082	0.002	R=0.131 R^2=0.017, Adj R^2=0.011	F (3, 542) =3.175, p=0.024
	A. PROD	-2.617	-2.632	0.009		
	A. CASHFLOWS	-1.506	-1.888	0.060		
	A. D. EXPEN	-0.651	-1.996	0.046		

Table 33: AEM Jones Negative Residuals

AEM Jones Negatives		B	T	p-value	Model	ANOVA
FTSE100 –VE	(Constant)	-0.076	-0.617	0.538	R=0.172, R^2=0.030, Adj R^2=0.024	F (3, 501) =5.083, p=0.002
	A. PROD	-0.559	-0.485	0.628		
	A. CASHFLOWS	0.903	0.149	0.881		
	A. D. EXPEN	-12.418	-3.27	0.001		
FTSE250 –VE	(Constant)	-0.014	-0.608	0.543	R=0.106, R^2=0.011, Adj R^2=-0.008	F (5, 947) =3.613, p=0.013
	A. PROD	-0.227	-1.104	0.270		
	A. CASHFLOWS	-2.731	-2.750	0.006		
	A. D. EXPEN	1.628	2.653	0.008		
FTSE Small Caps –VE	(Constant)	-0.077	-12.143	0.000	R=0.041, R^2=0.002, Adj R^2=-0.003	F (3, 629) =0.349, p=0.790
	A. PROD	0.004	0.028	0.977		
	A. CASHFLOWS	0.127	0.761	0.447		
	A. D. EXPEN	0.125	0.974	0.330		

REM Two Stage Least Square

Table 34: REM FTSE 100 Positive Residuals

REM FTSE100 +VES		B	T	p-value	ANOVA	Model
A. Cash Flows	(Constant)	0.018	1.018	0.309	F (5, 398) =3.02, p=0.030	R=0.149, R^2=0.022, Adj R^2=0.015
	D. Accruals	0.013	1.038	0.300		
	A. Production	-0.368	-2.591	0.010		
	A.D. Expenses	0.218	0.543	0.588		
A.D. Expenses	(Constant)	0.128	11.364	0.000	F (3, 215) =18.966, p=0.000	R=0.457, R^2=0.209, Adj R^2=0.198
	D. Accruals	-0.006	-0.519	0.605		
	A. Cashflows	1.022	3.167	0.002		
	A. Production	-0.420	-6.585	0.000		
A. Production	(Constant)	0.050	3.247	0.001	F (3,387) =12.319, p=0.000	R=0.295, R^2=0.085, Adj R^2=0.080
	D. Accruals	0.005	0.206	0.837		
	A. Cashflows	-1.022	-2.690	0.007		
	A.D. Expenses	-1.390	-3.000	0.003		

Table 35: REM FTSE 250 Positive Residuals

REM FTSE 250 +VES		B	T	p-value	ANOVA	Model
A. Cash Flows	(Constant)	0.061	6.513	0.000	F (3, 648) =6.004, p=0.002	R=0.164, R^2=0.027, Adj R^2=0.023
	D. Accruals	-0.139	-0.652	0.515		
	A. Production	-0.203	-3.053	0.002		
	A.D. Expenses	0.000	-0.003	0.998		
A.D. Expenses	(Constant)	0.192	12.060	0.000	F (3, 384) =3.838 p=0.010	R=0.177, R^2=0.029, Adj R^2=0.022
	D. Accruals	1.874	1.226	0.221		
	A. Cashflows	-0.883	-3.058	0.002		
	A. Production	-1.323	-2.076	0.039		
A. Production	(Constant)	0.116	2.660	0.008	F (3,852) =10.031, p=0.000	R=0.185, R^2=0.032, Adj R^2=0.031
	D. Accruals	-5.756	-2.192	0.029		
	A. Cashflows	-5.538	-4.647	0.000		
	A.D. Expenses	2.192	1.209	0.227		

Table 36: REM FTSE Small Cap Positive Residuals

REM FTSE Small CAPS +VES		B	T	p-value	ANOVA	Model
A. Cash Flows	(Constant)	0.076	5.835	0.000	F (3, 462) =4.515, p=0.004	R=0.169, R^2=0.028, Adj R^2=0.022
	D. Accruals	0.679	2.022	0.044		
	A. Production	-0.071	-0.767	0.443		
	A.D. Expenses	0.092	1.495	0.136		
A.D. Expenses	(Constant)	0.164	6.679	0.000	F (3, 297) =21.166 p=0.000	R=0.420, R^2=0.176, Adj R^2=0.168
	D. Accruals	0.187	0.468	0.640		
	A. Cashflows	-1.375	-7.800	0.000		
	A. Production	-0.633	-1.936	0.054		
A. Production	(Constant)	0.101	5.101	0.000	F (3,470) =11.716, p=0.000	R=0.246, R^2=0.070, Adj R^2=0.064
	D. Accruals	-0.400	-0.689	0.491		
	A. Cashflows	-0.325	-0.495	0.621		
	A.D. Expenses	-0.803	-3.107	0.002		

Table 37: REM FTSE 100 Negative Residuals

REM FTSE 100 -VES		B	T	p-value	ANOVA	Model
A. Cash Flows	(Constant)	-0.034	-4.972	0.000	F (3, 376) =16.424, p=0.000	R=0.340, R^2=0.116, Adj R^2=0.109
	D. Accruals	0.027	1.938	0.053		
	A. Production	0.131	6.685	0.000		
	A.D. Expenses	0.498	1.584	0.114		
A.D. Expenses	(Constant)	-0.058	-25.285	0.000	F (3, 561) =10.457p=0.000	R=0.230, R^2=0.053, Adj R^2=0.048
	D. Accruals	-0.006	-0.466	0.641		
	A. Cashflows	0.397	4.040	0.000		
	A. Production	0.046	2.448	0.015		
A. Production	(Constant)	-0.388	-3.692	0.000	F (3,387) =9.701, p=0.000	R=0.264, R^2=0.070, Adj R^2=0.063
	D. Accruals	0.096	1.665	0.097		
	A. Cashflows	3.680	4.019	0.000		
	A.D. Expenses	0.604	0.327	0.744		

Table 38: REM FTSE 250 Negative Residuals

REM FTSE 250 -VES		B	T	p-value	ANOVA	Model
A. Cash Flows	(Constant)	-0.043	-4.845	0.000	F (3, 797) =14.603, p=0.000	R=0.228, R^2=0.052, Adj R^2=0.049
	D. Accruals	-0.764	-2.105	0.036		
	A. Production	-0.158	-4.710	0.000		
	A.D. Expenses	0.274	1.617	0.106		
A.D. Expenses	(Constant)	-0.085	-26.181	0.000	F (3, 982) =3.241p=0.021	R=0.099, R^2=0.010, Adj R^2=0.007
	D. Accruals	-0.135	-0.502	0.615		
	A. Cashflows	0.051	0.848	0.397		
	A. Production	0.056	0.215	0.830		
A. Production	(Constant)	-0.386	-3.688	0.000	F (3,387) =9.892, p=0.000	R=0.267, R^2=0.071, Adj R^2=0.064
	D. Accruals	0.095	1.650	0.100		
	A. Cashflows	3.709	4.062	0.000		
	A.D. Expenses	0.552	0.300	0.764		

Table 39: REM FTSE Small Cap Negative Residuals

REM FTSE Small CAPS -VES		B	T	p-value	ANOVA	Model
A. Cash Flows	(Constant)	-0.047	-9.267	0.000	F (3, 417) =2.292, p=0.078	R=0.127, R^2=0.016, Adj R^2=0.009
	D. Accruals	-0.139	-1.038	0.300		
	A. Production	-0.187	-2.102	0.036		
	A.D. Expenses	-0.119	-1.732	0.084		
A.D. Expenses	(Constant)	-0.127	-7.478	0.000	F (3, 582) =5.314p=0.001	R=0.163, R^2=0.027, Adj R^2=0.022
	D. Accruals	-2.727	-3.004	0.003		
	A. Cashflows	-0.459	-1.464	0.144		
	A. Production	0.428	0.519	0.604		
A. Production	(Constant)	-0.248	-7.272	0.000	F (3,430) =3.851, p=0.010	R=0.162, R^2=0.026, Adj R^2=0.019
	D. Accruals	-0.523	-0.631	0.529		
	A. Cashflows	-0.908	-2.186	0.029		
	A.D. Expenses	0.340	1.981	0.048		

Before concluding the results and proceeding to the final chapter of this thesis it is also important to note that in addition to the test of endogeneity, the thesis incorporates fixed effects. The fixed effects are normally used to eradicate a form of endogeneity by a dummy that is aligned to a specific individual thus thereby eliminating unmeasured effects. Whereas Cohen et al (2008) do not provide a discussion on the fixed effects method or output in the paper for referencing. Badertscher (2011) does not explicitly elucidate the use of fixed effects in the methodology however he provides a passing commentary of the conclusions. Nevertheless, Badertscher (2011) does provide some explanation on the endogeneity and the use of the same in his paper. Other papers also follow this, they use the industry and year as fixed effects. Examples include Chan et al (2014) and Burnet et al (2014). These are denoted as u and d for firm and year-specific fixed effects. The need for inclusion of firm fixed effects is to aid in controlling for time-invariant differences while industry fixed effects as mentioned is to examine the differences between various factors across the sectors. The formulas are then shown as

$AEM_{i,j}$ =f (REM, instrumental variables+ $u + d+\varepsilon$);

$REM_{i,j}$ = f (AEM, instrumental variables + $u + d+\varepsilon$);

Just as stated in the endogeneity segment above, the fixed effect model may also have limitations. An example of this is that fixed effects are specific to individuals who have estimates and multiple observations. This is unlike random effects which have a difference and variability among wider subjects and different entities within a larger group. Another limitation of the fixed effects model is that there is an assumption of time-invariant of the fixed effects which may not be the case. Another difference is that whereas a random effect is accepted there are dissimilar estimates which normally have a normal distribution. The fixed-effects model assumes that there is one communal outcome. Whereas this thesis referenced Cohen et al (2008) for time series regression, this section that examines endogeneity and fixed effect is modeled on Badertscher (2011). Cohen et al (2008) do not provide a background or discussion on these two tests. Badertscher (2011) who examines AEM and REM for overvalued firms includes a brief commentary. Given that this is an ample discussion on endogeneity and a limited view on fixed effects it does give us sufficient understanding on these two methods. I have done the same for this thesis.

CHAPTER 5: SUMMARY, CONCLUSION AND RECOMMENDATIONS

In this chapter, I provide a conclusion to the overall thesis which will be a discussion on whether the paper has provided an answer to the questions posed. The chapter will also delve into the contribution of the paper based on the gaps in the existing research and the results as well as what are the implications for not only academic practitioners of accounting and EM but also for accounting professionals and the various government watchdogs and regulators that set accounting standards and legislation.

5.1 RESEARCH ANSWERS

From the introduction, the dissertation raised several questions. The initial question posed by the paper is whether there was a decline in liquidity that would necessitate EM. This could be viewed from the perspective that even though there was a financial crisis. There could be an argument that there was government intervention that would have bridged the liquidity gap. I have provided evidence for the decline in liquidity based on previous papers so the premise of this paper that there was a deep declining liquidity that had an impact on financing is well grounded and satisfactorily acceptable. This weakening in liquidity is despite the government intervention. The other questions include whether firms engage in EM as a possible option to improve performance and therefore attract funds for their various needs or maintain their current debt covenants agreement thus avoiding restrictions and if they do what form of EM method do they use that is either AEM or REM. Does size play a role in determining the use of EM for the firms during the financial crisis? Additionally, what are the other firm characteristics that are of interest in understanding whether a firm will use EM and the different characteristics that are of specific interest to AEM and REM separately, and also do the financial restrictions such as augmented debt levels or low working capital affect whether a firm will use EM to avoid the further restriction on their credit.

From the outset, I am confident that the paper has managed to provide answers to these questions not only from the methodology that is the type of data used, the hypothesis, the formulae, and the statistical approach that has been undertaken and its robustness but also from the structure of the arguments put forward and the derived empirical results. The first question is whether firms still use AEM or REM during the financial crisis and if this increases or decreases in this period. The results answer this question as we observe a decline in the use of AEM especially among FTSE 100 firms. From the time trend results we observe a significant relationship between the positive and negative residuals and the financial crisis period for the FTSE 100 firms for both the Jones and the modified Jones methods however, we do not observe conclusive evidence for a significant relationship for the positive and negative residuals for the AEM for FTSE 250. There is a significant relationship between the negative AEM residuals for the FTSE Small Cap firms and the financial crisis. However, we observe the use of different forms of REM by the three indices during the financial crisis period. For example, FTSE 100 firms use abnormal production costs while FTSE 250 and FTSE Small cap use abnormal discretionary expenses. This also provides evidence that the size of firms from a market capitalization perspective has an impact on the use of AEM and REM as far as it pertains to the financial crisis period. There is also a relationship

between AEM and REM that proves a substitution during the financial crisis. The results are robust when the AEM and REM residuals are correlated, this thesis goes further and runs a two-staged least squares to test for endogeneity which confirms the inter-changeability between the two EM methods.

I have separated the positive and negative residuals and then gone further to measure the median characteristics of these firms, these include for the interest cover, working capital, operating cycle, net operating assets, risk of bankruptcy, and tax rate. Furthermore, I have also included these variables in a multiple regression to observe the significance of the relationship. For AEM I measure the difference between the operating cycles and net operating assets for firms with positive and negative residuals. For REM I evaluate the level of the Altman Z-Scores and tax rates for the three indices for firms with positive and negative residuals for the three REM methods. I do these for both AEM and REM for interest cover and working capital by separating the positive and negative residuals for both methods and computing the firm's yearly average and median values. The results show that financial constraints have an impact in a firm's use of AEM and REM. The results show that firms with poorer financial ratios for interest cover use REM. I also incorporate the variables for specific AEM and REM for both methods in the regressions. I do these computations from the years 2004 to 2018 with an additional focus on the financial crisis period that is 2007 to 2008. These multiple regressions include other ratios such as debt ratio, debt to EBITDA, or Debt to equity. The results show various uses of AEM and REM depending on the sizes as well as various relationships with the financial ratios. For example, the results show a significant relationship between the REM residuals with the risk of bankruptcy. The relationship is observed for the positive residuals for abnormal production costs for FTSE 100 and negative residuals for abnormal discretionary expenses for FTSE 250 and FTSE Small Cap. As already noted the FTSE 100 used abnormal production costs as a REM method during the financial crisis while FTSE 250 and FTSE Small Cap have a significant relationship with abnormal discretionary expenses and the financial crisis period. Thus the risk of bankruptcy is one of the financial ratios of interest to this REM method as relates to the firm's size during the financial crisis. In general, EM is still used by firms during the financial crisis, the method depends on the size which is also influenced by the firm's characteristics and financial ratios.

5.2 CONTRIBUTION

The paper's intended to contribute to the development and advancement of the knowledge of EM especially as it relates to the financial crisis period. The study has achieved this by establishing the movement of both EM methods during the financial crisis. By delineating the firms with increased or decreased AEM and REM then performing a time trend analysis with time and financial crisis as among the various respective variables. The study enables us to have a much deeper understanding of the AEM and REM movements for these viewpoints. As already discussed, some of the gaps noted in the EM literature are that studies in these areas are done in periods of normal time while those undertaken during the financial crisis only use AEM. This paper by its methods and empirical results has managed to provide this contribution that not only investigates EM during the financial crisis but also examines both EM methods that is AEM and REM thus providing a fuller picture devoid of the limitations observed in previous EM studies. This has not only been

done on a selected size of firms but on the FTSE All Share three indices that is FTSE 100 (Large firms), FTSE 250 (Medium-sized firms), and FTSE Small Cap (Small firms) thus also providing evidence on the effect of size but also on more or less the general stock market as they represent close to 98% of London Stock Exchange.

A further contribution of the thesis is in the investigation of the effect of financial constraints such as debt level restrictions on a firm's use of EM especially during the financial crisis period. This is further developed by the variables that examine how other firm characteristics such as operating cycle, net operating assets, risk of bankruptcy, and tax impact on the use of both EM methods. I contribute to the movement of EM among firms that have financial constraints and whether the financial crisis and the deepening liquidity constraint is a strong enough motivation for them to increase their use of EM and then segue between AEM and REM. This contribution provides a different angle to understanding EM in a period of financial turmoil when firms need financing. Whereas other studies investigate EM motivation such as incentives to increase executive pay or meet or beat analyst's forecasts during normal times, this thesis examines the financial and liquidity constraints of firms and how a worsening macro-economic environment impacts their motivation therefore providing compelling reasons for the use of the two EM methods, to my knowledge this is an original study or analysis of this approach and nature in this EM arena for UK London Stock Exchange firms.

Another contribution is in terms of the methods and firm sizes that have been used in that the paper has analyzed the respective components of the FTSE ALL Share index that is FTSE 100, FTSE 250, and FTSE Small Cap. Even though this is not the main contribution of the research it is worth noting that I examine firms based on their market capitalization, the results are also of interest as we observe large firms that are FTSE 100 with much more significant decline in AEM during the financial crisis as compared to the FTSE 250 and FTSE Small cap. Additionally, there is a significant relationship between FTSE 100 positive and negative AEM residuals and the financial crisis period which is dissimilar to the other two indices. There is also a different use of the three REM methods for the three indices. Other papers distinguish firm sizes based on other financial metrics such as net assets. I further analyze these constituent indices' firm characteristics to provide a much deeper understanding of the interaction between the firm size, characteristics, and EM movement in normal times and also during the financial crisis period. I regard that this is also the distinction of this study in its investigation of AEM and REM in its process and sample data. In general, the study has managed to achieve the set-out contribution and provide some added knowledge to the field of EM which is considerable of interest to the regulators, accounting academic community, and practitioners.

This thesis provides us with an understanding of firms operating in declining liquidity and an improved financial reporting regulatory environment during the financial crisis period. It investigates AEM and REM and which form of EM do firms prefer at this time and some of the reasons as to why they would lean towards one EM method rather than the other. As already discussed, the introduction of IFRS in 2005 and the amendments after the 2008 financial crisis provided greater reporting visibility as it pertains to firms' relationships with other subsidiaries and investments. This paper provides a contribution that compares the use of AEM by not only

firms of varying sizes furthermore it compares firms of the same sizes of different characteristics. The thesis observes that the declining liquidity at this time is a motivation for firms as compared to their peers to use REM when they have worse interest cover and working capital ratios. The need to avoid penalties from regulators or funders due to poorer reporting quality at the financial crisis period while at the same time obtaining funding or avoiding greater restrictions on their debt covenant is an incentive for firms to use REM as opposed to AEM. The literature review discusses reasons as to why firms would use REM instead of AEM. These include high-quality auditors, a stringent regulatory environment and to avoid claw backs. These are just some of the drawbacks to using AEM. On the other hand, managers opt for REM for various reasons for example it is under their purview and also it is more difficult for external stakeholders to detect. The results therefore provide evidence of the use of REM instead of AEM during this financial crisis period.

The improved regulatory architecture during the financial crisis period necessitated the need for firms to use a form of EM that would be less transparent and accountable. IFRS 12 which guides firms in the reporting on the relationship with other firms was to provide a greater transparency in how companies are dealing with other related entities. IFRS 10 also strengthened the firm's approach to consolidation. In this respect, firms will consolidate accounts on the basis of control and not necessarily the percentage of ownership. These standards that were introduced and improved due to the financial crisis provided transparency in that firms may eschew reporting negative relationships or associations with firms whose performance is declining or avoid reporting negative relationships. One way to avoid contravening the accounting standards and at the same time being able to use EM is through the use of REM. Firstly REM is much more difficult to detect than AEM and secondly, it is under the purview of management (Cohen et al, 2008 and Ipino and Parbonetti (2017

). The results show that the three sizes of firms that is FTSE 100, FTSE 250, and FTSE Small Cap use REM instead of AEM. This supports the claim that the need for firms to report their financial statements within the improved regulatory architecture during the financial crisis which requires transparency and accountability made REM more viable and allows the firms to use EM and show that they are still financially strong and able to come out of the financial crisis quicker than their peers.

The results support other papers that show REM is a method of choice when AEM is restricted when there is an improved regulatory architecture. Gunny (2005) finds that firms will still use REM despite its detrimental effect on cash flow and long-term value. They note that one consequence of regulations is that REM becomes a strong option. As discussed earlier in the literature review, when accounting standards are prohibitive then managers will default to REM. Previous papers find that EM is pervasive thus if AEM is restricted then firms segue to REM. Ewert and Wagenhofer (2005) observe that when accounting standards are improved or reinforced therefore decreasing the space for discretion in accruals then REM increases. The form of REM used by firms will vary between abnormal production costs, abnormal cash flows, and abnormal discretionary expenses depending on the incentive for one or two of these methods. This also strengthens the contribution of this thesis in that an examination of only one form of EM may not provide us with the full picture. This is also supported by Fields et al (2001) who observe that

when analyzing EM researchers need to take both methods into consideration as managers who are restricted by AEM will still need to achieve their objective hence they will use REM.

5.3 LIMITATIONS

Despite the attempts to provide robust research, the paper still faced certain limitations that are worth noting, this would be of interest to the various stakeholders that use this paper. It is also important to note that these limitations are not of significant level to have an adverse effect so as to materially impact on the thesis or the results. However, their impact even though not overly weighty in nature, in general, cannot be ignored or assumed. One limitation of the paper is that the market capitalization data is obtained at the end of the financial year. I do not compare these to different points in the year that is quarterly data. I use the London Stock Exchange market capitalization as reported by the Russel Group as at the 2nd of January of the next year. It may be possible that there are firms that could have been impacted by certain political or macro-economic factors that would have affected their business operations either positively or negatively hence an upward or downward movement of their share price. The market capitalization for several points in the year would then provide a wider sample for comparison of the movement of the firms between the three indices and maybe deliver a much broader picture. Nevertheless, the data at the end of the year still provides us with sound and reasonable data of the firms that represent the three indices at that point. Furthermore, the data extends for several years hence this assures us that the limitation and negative impact of not obtaining market capitalization for the firms at several points during the year would not have a significant or material impact. Any firm that would have an upward or downward movement would still have a presence over several years thus it would be included at some point in the research. I retain firms in an index if they maintain a certain market capitalization hence avoiding survivorship bias, in essence the fact that a firm would at some point have a presence in an index and by this would be retained over time negates the adverse effects of not collating data at several points during the year.

Another limitation of the paper is that I have used the generally accepted formulas in previous papers for AEM and REM. The Jones and Modified Jones for AEM and Roychowdhury (2006) for REM. These are discussed in the literature review. As already outlined, there are other formulas for AEM such as Dechow et al (1995), Petroni (1992). Beneish (1997) and Beaver and McNichols (1998). This research does not use these formulas which may be a limitation. We do not know how the results of our data would be if we used these formulas and correlated them to REM formula for Roychowdhury (2006) and also how certain firm characteristics and variables such as operating cycle or net operating assets would have an impact on these formulas during normal times and in the financial crisis period. Nevertheless, the Jones and Modified Jones formulas are generally accepted within the accounting academic and research community as reliable and sound methods for detecting and determining discretionary accruals. The methods for this paper follow previous papers such as Cohen et al (2008) and Badertscher (2011) which use Jones and Modified Jones for AEM and Roychowdhury (2006) for REM thus the same formulas have been used for this thesis. I therefore regard that this limitation of not using other formulas even though it is worth pointing out does not necessarily imply that the results of this research are insufficient or in doubt. This may provide a basis for future research in this area and a platform for research to be extended from

this thesis. The same applies to REM for which I have used the three Roychowdhury (2006) abnormal levels analysis, this provides room for a researcher to use other formulas and then correlate the same to the AEM movement to identify whether there is a substitution effect during normal times and in the financial crisis period.

For this formulae discussion, I also point out the methods of McNichols (2002). I use this method in this thesis as it focuses on cash flows. McNichols (2002) examines the cash flow from operations in multiple periods. Cash flows are therefore recognized in period t and t-1 and t+1. Other items can affect the analysis of cash flows. These include mergers and acquisitions of firms or even divestitures. In essence, the cash flows may not correspond from one period to another. The results for McNichols (2002) for this paper unlike Jones (1991), Modified Jones and Kothari model are not significant for the financial crisis however they are significant with time. I also discuss in the analysis section of the difference between accruals and operational cash flows. Therefore a shortcoming of using the McNichols (2002) is that operational cash flows can have inherent defects which can be a framework for future research of AEM during the financial crisis. Other cash flows such as free cash flows, cash from financing activities and cash from investing activities provide possible metrics and can be compared to accruals results. Schilit and Perler (2010) note that there are several ways through which cash flows can be manipulated. These include the transfer of cash flows from operating activities into financing activities or from investing activities to operating activities. Additionally, there could be a transfer of cash flows from operating activities to acquisition or ancillary activities. Therefore when investigating cash flows there is a need for a broader view rather than one of operational cash flow focus.

The other cash flows such as financing and investing activities notwithstanding there are also other models that allow us to compute operational activities different from the McNichols (2002). The operational cash flows can also be investigated in other ways. The McNichols (2002) model is a solution to the problem faced by Dechow and Dichev (2002) which has an inherent weakness in that it does not take into account the firm's economic changes, whereas Jones (1991) has the limitation in that it does not take into account the firm's cash flow. McNichols (2002) therefore incorporates both of these limitations into one model. She claims that this makes the formula superior. This thesis already pointed out in the results section the inherent defects of operational cash flows and in the instances where accruals provide better results than operational activities and vice versa. Nevertheless, the inability of McNichols (2002) to provide significant results for this thesis does not mean the same may be the results for other operational cash flows. Other models compute the operational cash flows in a different method to Dechow and Dichev (2002) and McNichols (2002). An example is Kasznik (1999) which includes cash flows only in year t and does not use year t+1 and t-1. Therefore whereas the McNichols (2002) model has its demerits earlier pointed out such as its volatility in detecting intrinsic firms with no EM this is because it is based on Dechow and Dichev (2002) that picks up volatility in accruals therefore its unpredictability in earnings examination. There are still other models such as Francis et al. (2005) that dichotomize the discretionary and discretionary accruals that can be used for investigating operational cash flows thus this thesis cannot generalize the cash flow impact from operational activities as well as financing and investment activities. This provides an avenue for future research of AEM and financial crisis from a broader cash flow methodology angle.

A final limitation of this research is that this data is obtained only for publicly traded firms within the London Stock Exchange hence the results need to be interpreted from this perspective. Unlike publicly traded firms, for private firms, the general populace does not have a chance or open opportunity to buy or sell their stocks and will have a separate ownership structure and prohibition on the transfer of shares. Additionally, the financial statements and reporting guidelines will not be the same as those that are public. This may also have an impact on their use of AEM and REM. For example, firms that are privately owned with few shareholders may not have as erudite investors the same way that public companies may have institutional investors such as pension funds or insurance companies who can afford to employ qualified personnel or have the necessary electronic tools to discern AEM activities. This may provide a greater motivation or incentive for them to use AEM. Furthermore, the shareholders of these firms may also be the management therefore the corporate governance structures may not have a restraining effect. They may therefore not have the fear that their compensation or bonuses would be clawed back in the future, this does provide more room or space for them to engage in AEM. The anticipation would therefore be that the operating environment does provide a fertile opportunity for the same to use AEM as opposed to REM. It would be of interest if this is the case and whether the same is observed during the financial crisis period and with respect to those firms that have financial constraints.

In general, even though there are limitations that are encountered in this paper, I regard that this research when studied in its context does provide us with a sound thesis not only from its background of declining liquidity and preceding framework but also to the methodology and empirical analysis. The paper undertakes EM research for publicly traded firms that is the FTSE All share three respective constituent indices and use the generally accepted formulas for both AEM and REM to establish this. Even though I admit that there are limitations in the paper, these are either not as significant to undermine or negate the results but it is worth mentioning these limitations to also provide a basis or framework by which future research can be extended from this paper. Therefore the research given its's setting and intended contribution does fulfill its objective and has implications for the various stakeholders that interact with the firms in our sample.

5.4 IMPLICATIONS

This study has several implications for various fields within the accounting academic research community, for the standard setters and regulators, and finally for those in the accounting practice. I discuss the implications in this section. For the accounting research community, this thesis first provides proof of the use of EM for firms during normal times and in the financial crisis period. The results show that there is a difference in the use of EM for firms during these two distinct times. For example, we find that there is a significant decline in the use of AEM for FTSE 100 (Large Public listed firms) in the financial crisis period. There is also a different use of the three REM methods for firms of the three indices. The implication is that when analyzing EM rather than viewing this in general, there is a need to dichotomize the period and macro-economic factors at play during that time. As this research has established these periods have a different impact and motivation for firms to use either AEM or REM thus the need to have a divergent application of the EM discussion and analysis. Secondly, when conducting EM research, size does play a role in

the firm's use of either AEM or REM. This is evidenced by a much more significant decline in the number of firms that use AEM during the financial crisis for FTSE 100 as compared to FTSE 250 or FTSE small cap. It is also observed in the different use of REM by the three indices during the financial crisis period. The relationships are observed in the significant relationship between the positive and negative residuals of the FTSE 100 AEM residuals and the financial crisis period. The same is true for REM positive and negative residuals. Admittedly this paper uses market capitalization while other studies use asset size. Nevertheless, the empirical outcome does provide evidence that size is also a factor in the method of EM choice.

There may be other reasons associated with size such as the level of institutional ownership or financial reporting guidelines that may play a role in the use of EM thus this is also an implication for regulators and standard setters as they review the guidelines associated with improvements in the quality of reporting. There is a need to have an understanding of how firms of different sizes use AEM and REM. Therefore when the relevant bodies introduce legislation they may have to segment this so that the various sections are specifically targeting the firms of interest. This is also of importance when the regulatory bodies or external auditors are reviewing the financial statements and the quality of financial reporting. For example, in a financial crisis period based on the results of this paper, there may be a temptation for them to draw the conclusion that the FTSE 100 firms have improved their financial reports due to the decline in the use of AEM, however as shown in the empirical results they still use REM through abnormal production costs hence the need to review both forms of EM not only for firms in general but also based on their various sizes and characteristics.

The paper also has implications for regulators and auditors in their review of the financial statements. This paper has incorporated the time trend analysis method as used by Cohen et al (2008). As outlined in the methodology section this statistical tool enables us to obtain the movement of the data over a period of time by introducing several other variables. The implication for regulators and auditors is that such EM data that is non-stationary will be better analyzed by time trend. As Cohen et al (2008) state, these variables which exhibit significant time trends in motion thus they ''render traditional summary statistics uninformative''. This is of interest to the various stakeholders as it provides evidence of the usefulness of time trends in examining data over a period of time. It is therefore an approach that can be applied when auditing or evaluating a firm's reporting. Customarily accounting information is compared between the previous year and the current one. This is also the approach that is taken by the financial statements reports that is income statement, balance sheet, and cash flow statement. However, this paper shows that analysis can extend over several years to provide a fuller picture of the use of EM and financial reporting. Additionally, the auditors and regulators can also include more variables that would be of interest in their use of the time trend analysis by a multiple regression.

These methods can also be used by accounting practitioners when analyzing various sets of data over a certain number of years. Accounting practitioners can also use these methods when comparing their financial statements to those of other firms or competitors. Firms can use the methods outlined in this paper and run their numbers side by side with other companies to equate their financial reporting quality to their peers. They can do this for firms of the same size and

characteristics for a much better analysis. Secondly, the paper has implications for accounting practitioners as the results show that some firms may not necessarily use AEM during the financial crisis period however they may use REM. Even though the inferential statistics may not necessarily be significant for all the three REM, the data shows that some firms still use one of the three REM's methods during this time. This should be an alert to practicing accountants, investors, and funders who should not only rely on the decline in the AEM numbers or residuals however they should also correlate this to REM formula. As outlined before REM is within the management's purview however this does erode value over the long term hence investors would be keen on this as it impacts on the firm's cash flow and return on capital. Furthermore, as these REM methods become much more acceptable and an adaptable theme in EM research just the same way that AEM has been accepted akin to the use of the Jones and Modified Jones methods which are now a central feature in this field of research then practitioners will be inclined to take note and include the REM methods as well. There is also an implication that further down the line the regulators and investors may introduce clauses in the firm's and management's contracts that would have claw backs for REM just the same way that this is the case for AEM in certain jurisdictions. This is if the REM methods are deemed to be extremely and significantly deteriorating the firm's long-term value.

Apart from the regulatory implications, the thesis and results also have implications for governments on social and economic ramifications. As discussed earlier in this thesis, governments intervened during the financial crisis so as to restore liquidity to the pre-financial crisis levels. Previous papers discuss on this, they include Acharya et al (2017) who note that certain banks were saved by governments and others forced to merge. Bebchuk (2009) observes that the government intervention through the asset purchase programs was to assist and provide some form of stability to the financial institutions. Gorton et al (2004) also observe that the purchase of assets by governments was one of the last results option given the size of the problem. The ramification of this thesis and the results as it pertains to the government intervention is that by directing funds to firms that had propped up their financial performance through REM then these funds could have been used for other social and economic activities. The funds injected by the government are from taxes or as a result of debt. This should then be used efficiently to improve social services such as health or security and at the same time improve the economy.

Baumbach and Gulis (2014) note that the global financial crisis had negative social factors such as homicides, suicides, and transport accident mortality. There was therefore a need for funds to invest in reducing these incidents. Undoubtedly, governments have limited funds either through taxes or debt. This is compounded during the financial crisis when there is a decline in liquidity in the markets therefore the government has to intervene despite its limited funds. Reinhart and Rogoff (2009) note that countries' social services are affected during the financial crisis. One of the social impacts is the government debt. Therefore the government spending at this time is important. The government should use taxation or debt to areas that improve society and human being, these include health, education or unemployment during this time. Fazzari et al (1988) find that healthy firms and those with better financial metrics are able to find funds much better than their competitors during a crisis such as the financial crisis period. This thesis shows that an examination of REM as a variable for risk management during this time is important when governments and banks are determining where and how much funds can be allocated to different

firms. The sub-optimal allocation of capital at this time could have negative ramifications on social services as well as the country's GDP. Reinhart and Rogoff (2009) studied the effect that the financial crisis had on the economy. They examine the impact that the global financial crisis had on unemployment, housing, stock prices, output, and government debt. They found that there was an impact on social services during the financial crisis. This thesis which finds that firms used REM as opposed to AEM during the financial crisis therefore provides an important element to use when properly measuring firms that would be devoid of financial statements propped up by EM performance and thereby enable funds to be directed to the correct firms and social/ economic areas.

A final implication of this research is that it is of use to investors and financiers who may seek to advance loans or capital to firms in a period of great financial decline. The implication is that firms may show that they have weathered the financial crisis storm and thus are strong and able to grow quickly once this period ends. However, these financial statements could be a result of EM. As evidenced by the results firms with weaker financial metrics such as tax rates or risk of bankruptcy have a higher propensity to use REM. On the other hand firms with poorer financial ratios such as interest cover will shy away from using AEM. The implication for firms and investors during this period of declining liquidity when the financing from banks decreases and other forms of credit such as credit lines from suppliers are constrained is that the financial statements need to be much more closely examined not only for AEM but also for REM which is more difficult to detect. The analysis for REM should be based on several factors such as size or firm characteristics as these have an impact on the results.

5.5 FUTURE RESEARCH

To conclude this paper I discuss the other forms of research that can be derived from this thesis. As I write this paper the world has just undergone a pandemic that has negatively affected all countries around the globe. The Coronavirus also known as COVID spread to continents far and wide leading to the decline and bankruptcy of firms in several industries from restaurants to retailers and airlines. This public health pandemic meant that people had restrictions to movement with staff working from home and people unable to travel from place to place or from country to country. This has drastically impacted businesses such as the hospitality sector that relies on socializing or air travel which has been affected by governments closing borders in order to keep their citizens safe from the different COVID variants that evolved from the initial phase. The genesis of the 2007/2008 financial crisis was the housing market and the mortgages that outstripped the home value. This is distinct from a health pandemic. However at this point in time the effects of the COVID pandemic can be related to the financial crisis periods as governments all over the world were instituting measures to keep their economies afloat. In the UK the government was supporting businesses by advancing funds to the banks who then loan this to businesses that will repay the facilities at a later date. The pandemic effects and the declining liquidity that was being faced across the globe can be mirrored in the financial crisis as businesses faced bankruptcy and some had to close down. This then brings up the issue of EM and the need to show that the firms are still strong and are able to come out of the pandemic much better than their competitors or peers.

I regard that the COVID period provides an opportunity to extend this research further and augment our understanding of EM in a financial crisis period. This paper has obtained data for FTSE All share firms to the end of the 2018 financial year. The COVID pandemic was experienced in the year 2020 to late 2021 and 2022 in some countries thus the financial statements for these years will be of interest to investigate whether there would be EM and the motives thereof. One difference in the incentives during this time would be that firms would use income-decreasing methods in order to obtain government support. Therefore the same formulas for AEM and REM would be at play not necessarily to improve the performance but to portray a declining position so as to receive funding or tax incentives or debt payment holidays. I espouse this view because several businesses closed especially in the hospitality industry with some opening for short periods and then having to close again when the second or third wave of the pandemic arrives. There would therefore be an anticipation of poor performance as any other result to the contrary would be unexplainable given that the only sales during this time were for example for home deliveries in the hospitality sector or the airlines were only being used for the transportation of cargo. I would anticipate that firms would for example take a ''Big bath'' in this time to depress the numbers further. They would incur charges that they would not necessarily have been expensed or take up costs that they had deferred for the future but feel that this is the appropriate time to do so. They can reverse them in the subsequent periods when the pandemic has receded.

Another difference between the 2007/2008 financial crisis and the COVID pandemic period is that in the previous financial crisis, liquidity had declined significantly and the government was injecting money into the system so as to keep banks and the economy afloat. Certain firms with sound financial footing would still meet their debt obligations while others could draw down on their existing credit lines. This (COVID) time there is a dichotomy in the macroeconomic environment and the legislative and government intervention. For example, in certain countries there is legislation that restricts landlords from evicting tenants and in others, there is a holiday on payment of loans and mortgages. The effect is that firms with debt and leverage are under a different type of financial crisis. Additionally, certain governments are assisting firms to pay their employees for example with monthly checks in the US and a furlough scheme in the United Kingdom. Thus the financial institutions would not restrict the debt covenants as they are barred by the governments from doing so during this time. Furthermore, the shareholders for example the public investors at the stock exchange would be anticipating a depressed performance as there is simply close to zero activity in certain sectors of the economy so anything to the contrary would not make sense. In this regard firms in these industries which is the majority would not be under pressure to improve their numbers upwards but from the literature review, in such instances, it would be vice versa. In essence, this thesis can be extended further for a COVID period analysis of how firms use EM during this time to achieve the motives and incentives, the framework in this research provides a strong foundation for conducting this research and the results and implications thereof.

Another research that can be extended from this paper is investigating EM during the financial crisis with the use of other formulas that are distinct from the Jones, modified Jones and Kothari model for AEM or the Roychowdhury (2006) for REM. As already outlined one limitation of this paper is that the methodology for computing EM has generally used the by and large accepted

formulas however this does provide an opportunity for a researcher to compare these results with that of other formulas for AEM. These include Dechow et al (1995), Petroni (1992). Beneish (1997) and Beaver and McNichols (1998). Future research can use specific accruals such as McNichols (2002) or Francis et al (2005) that would also involve the need for research designs that take into account elements such as mergers and acquisitions and divestitures or growing firms versus those declining to avoid discordant cash flows periods that negatively impact results. The same applies to REM which this paper uses as the three Roychowdhury (2006) abnormal levels analysis. As already proposed this provides room for a researcher to use other formulas and then correlate the same to the AEM movement to identify whether there is a substitution effect during normal times and in the financial crisis period. This is not to say that the results would be different however the results could provide a further and deeper understanding of EM during the financial crisis period also as it regards to other accounting and variable metrics.

Finally, corporate governance is also an important variable that impacts a firm's use of AEM and REM. For this thesis, the decline in the use of AEM by large firms is attributable to the significant proportion of institutional investors. On the other hand, small firms have a decline in AEM as they had already drawn down their funding from the banks (Block et al 2010) and would therefore have less incentive to use AEM as the banks would be able to find this out. On the other hand, they use abnormal discretionary expenses as opposed to large firms that use abnormal production costs. Previous papers such as Zang (2012) and Chan et al (2014) note that institutional investors would be opposed to the decline in the spending of discretionary expenses such as research and development as this would affect future sales, growth, and cash flows. They would also have professionals capable of detecting AEM. This thesis's results support the corporate governance observations in other papers. The agency theory which is a framework for this thesis is reinforced by the nature of ownership of firms depending on their size that determines the type of use of AEM and REM as well as their relationship with external stakeholders. I therefore have not included the variables in this thesis as the over-arching corporate governance variables that impact the results are in tandem with previous papers. However, the corporate governance themes provide room for future research and their impact on AEM and REM during the financial crisis. These include for example the separation of CEO and Chairman to the board or the executive remuneration and how these and other corporate governance variables impact the results.

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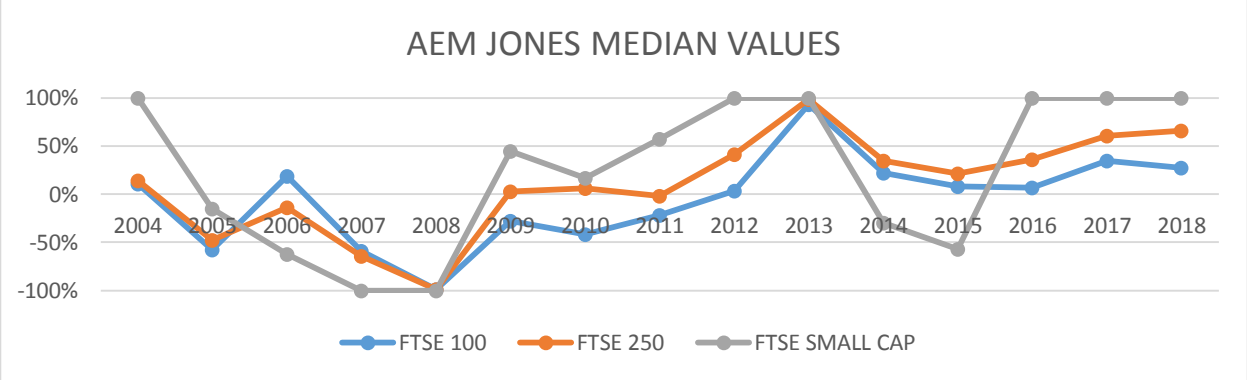
APPENDIX A: DESCRIPTIVE STATISTICS

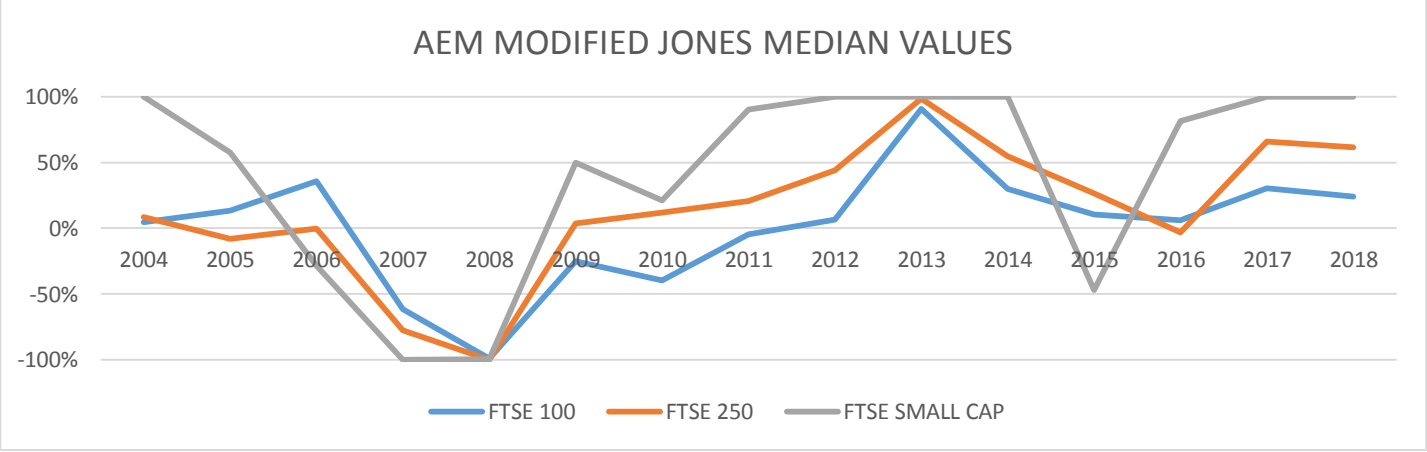
APPENDIX I: **AEM (Jones) median results for the three indices**

AEM (JONES)	FTSE 100	FTSE 250	FTSE SMALL CAP
2004	0.00496705	0.00161680	0.04088628
2005	(0.01505640)	0.00262715	0.00845505
2006	0.00388807	(0.00679883)	(0.00992124)
2007	(0.01284423)	(0.00124263)	(0.00773968)
2008	(1.06741140)	(0.00535590)	(0.00880542)
2009	(0.00580757)	0.00641249	0.00874652
2010	(0.00988617)	0.01124539	0.00258915
2011	(0.00340168)	0.00310517	0.00931057
2012	0.00143870	0.01474628	0.02328603
2013	0.12583515	0.00721406	0.00257510
2014	0.00855325	0.00506071	(0.02535343)
2015	0.00524009	0.00842967	(0.04975598)
2016	0.00250714	0.01044373	0.02302952
2017	0.00957855	0.00698829	0.01095476
2018	0.00949351	0.01335858	0.01198674



APPENDIX II: AEM Modified Jones Median for the three indices

AEM (MODIFIED JONES)	FTSE 100	FTSE 250	FTSE SMALL CAP
2004	0.0018489	0.0017270	0.0379327
2005	0.0013424	(0.0021591)	0.0066999
2006	0.0066083	(0.0066688)	(0.0052709)
2007	(0.0093543)	(0.0024595)	(0.0034155)
2008	(1.0942851)	(0.0078890)	0.0012177
2009	(0.0062506)	0.0071746	0.0115719
2010	(0.0101128)	0.0131542	0.0023403
2011	(0.0007587)	0.0040001	0.0110848
2012	0.0027248	0.0155342	0.0233494
2013	0.1319314	0.0113908	0.0022078
2014	0.0085388	0.0070614	0.0128133
2015	0.0070630	0.0106311	(0.0493890)
2016	0.0017966	(0.0027923)	0.0259276
2017	0.0103248	0.0118961	0.0115400
2018	0.0080430	0.0125011	0.0128018



APPENDIX III: REM Abnormal Production median residuals for the three indices

ABNORMAL PRODUCTION	FTSE 100	FTSE 250	FTSE SMALL CAP
2004	0.054279813	0.050998641	-0.003989258
2005	0.052918707	0.048258055	0.03676152
2006	-0.75788079	0.031245611	-0.091867618
2007	0.003885707	0.019582319	0.047849711
2008	0.061520355	0.034880507	0.046519529
2009	0.019113646	0.022732589	0.061971465
2010	0.015654833	0.023922118	0.041030493
2011	0.020081153	0.018611825	0.040456062
2012	0.035133462	0.030378457	0.028190783
2013	0.04721459	0.009482333	0.038088166
2014	0.030119338	0.036924548	0.066867403
2015	0.034723447	0.021319506	0.038227855
2016	0.033097648	0.03141459	0.056430152
2017	0.021826118	0.715472536	0.041173713
2018	0.017824737	0.03676771	0.062884239

APPENDIX IV: REM Abnormal Cash Flow median residuals for the three indices

ABNORMAL CASH FLOW	FTSE 100	FTSE 250	FTSE SMALL CAP
2004	-0.0113977	-0.022976396	0.043838855
2005	-0.00942043	-0.016643141	0.018843416
2006	-0.10099546	-0.021740972	0.025395922
2007	-0.02229954	-0.030229271	-0.016694274
2008	-0.01476614	-0.030025179	-0.011640375
2009	-0.00599652	-0.011359105	-0.001372713
2010	-0.01518054	-0.022279077	-0.002313676
2011	0.03117255	-0.025904312	-0.011627558
2012	-0.01050315	0.021985514	-0.00490228
2013	-0.00876768	-0.009958561	-0.014227999
2014	-0.00453013	-0.00576668	-0.014560835
2015	-0.01188659	0.004426371	-0.007489695
2016	0.00159175	0.015688212	-0.010941311
2017	-0.00265143	0.009135699	0.009109101
2018	-0.00202585	0.009525574	-0.004314823

APPENDIX V: REM Abnormal Discretionary Expenses Median for the three indices

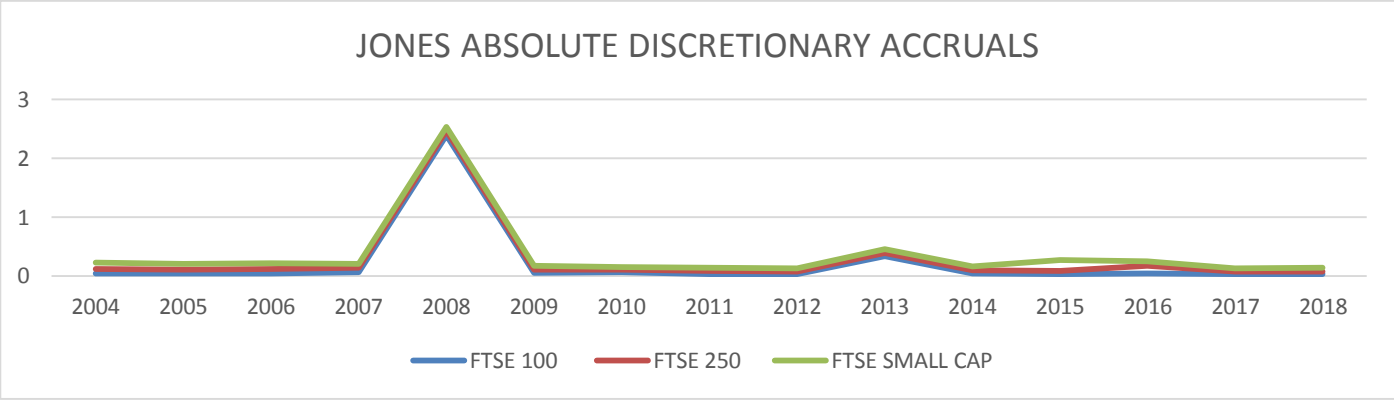
ABNORMAL DISCRETIONARY EXPENSES	FTSE 100	FTSE 250	FTSE SMALL CAP
2004	-0.04453913	-1.82338E-06	-0.07477031
2005	-0.05129493	-0.062159194	-0.073584003
2006	-0.05169523	-0.042410176	-0.102418075
2007	-0.04615053	-0.0526559	-0.100426809
2008	-0.05561622	-0.053847826	-0.089708139
2009	-0.04754333	-0.043295308	-0.089057572
2010	-0.05099997	-0.056436756	-0.084335638
2011	-0.0417917	-0.033713047	-0.088333501
2012	-0.04044259	-0.043322328	-0.082153049
2013	-0.05267369	-0.047487054	-0.089921523
2014	-0.04024288	-0.047979474	-0.08572065
2015	-0.04938572	2.07317E-07	-0.08572065
2016	-0.03918641	-0.045353126	-0.072758395
2017	-0.03346234	-0.032289817	-0.075322788
2018	-0.03389519	2.08661E-07	-0.073114628

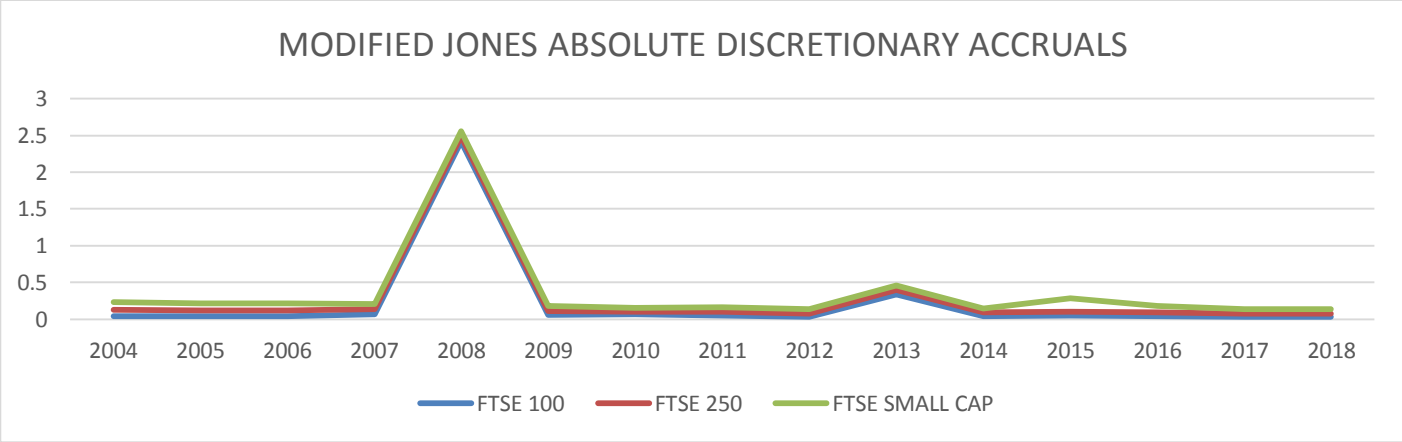
APPENDIX VI: Jones Absolute Discretionary average residuals

FTSE100	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
NEGATIVE DA	0.038	0.033	0.037	0.041	1.359	0.042	0.042	0.024	0.025	1.666	0.040	0.029	0.035	0.027	0.025
POSITIVE DA	0.045	0.043	0.043	0.131	10.096	0.078	0.117	0.056	0.031	0.189	0.035	0.036	0.043	0.039	0.025
DIFFERENCE	0.007	0.010	0.005	0.090	8.737	0.036	0.074	0.033	0.006	(1.478)	(0.005)	0.007	0.007	0.012	(0.000)
FTSE 250	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
NEGATIVE DA	0.063	0.065	0.068	0.063	0.068	0.052	0.046	0.048	0.043	0.046	0.049	0.050	0.170	0.038	0.051
POSITIVE DA	0.106	0.091	0.092	0.091	0.081	0.052	0.034	0.061	0.045	0.070	0.060	0.058	0.057	0.051	0.053
DIFFERENCE	0.044	0.026	0.024	0.028	0.013	(0.001)	(0.011)	0.013	0.002	0.024	0.011	0.008	(0.114)	0.013	0.002
FTSE SMALL CAP	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
NEGATIVE DA	0.131	0.101	0.084	0.060	0.068	0.082	0.049	0.054	0.069	0.055	0.046	0.111	0.113	0.057	0.063
POSITIVE DA	0.089	0.083	0.109	0.088	0.072	0.065	0.043	0.060	0.052	0.075	0.081	0.507	0.066	0.065	0.061
DIFFERENCE	(0.042)	(0.018)	0.025	0.028	0.005	(0.017)	(0.007)	0.005	(0.017)	0.020	0.035	0.396	(0.047)	0.009	(0.002)

APPENDIX VII: Jones Absolute discretionary median residuals

FTSE 100	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
NEGATIVE DA	0.028	0.026	0.021	0.032	1.524	0.025	0.033	0.018	0.019	0.087	0.014	0.019	0.030	0.023	0.017
POSITIVE DA	0.012	0.024	0.029	0.051	0.754	0.012	0.033	0.015	0.023	0.177	0.021	0.026	0.026	0.034	0.019
DIFFERENCE	-0.016	-0.002	0.008	0.019	-0.769	-0.013	0.000	-0.003	0.004	0.090	0.007	0.008	-0.005	0.012	0.002
FTSE 250	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
NEGATIVE DA	0.052	0.043	0.055	0.037	0.054	0.045	0.031	0.041	0.032	0.036	0.036	0.036	0.064	0.031	0.037
POSITIVE DA	0.052	0.047	0.048	0.043	0.040	0.037	0.024	0.040	0.036	0.034	0.032	0.033	0.037	0.025	0.028
DIFFERENCE	-0.001	0.003	-0.007	0.007	-0.015	-0.008	-0.007	-0.001	0.003	-0.002	-0.004	-0.004	-0.027	-0.006	-0.009
FTSE SMALL CAP	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
NEGATIVE DA	0.036	0.064	0.058	0.037	0.045	0.050	0.038	0.040	0.034	0.042	0.045	0.115	0.056	0.043	0.042
POSITIVE DA	0.058	0.048	0.057	0.056	0.049	0.034	0.027	0.031	0.036	0.026	0.033	0.067	0.058	0.032	0.055
DIFFERENCE	0.021	-0.016	-0.001	0.019	0.004	-0.016	-0.012	-0.009	0.002	-0.016	-0.012	-0.049	0.002	-0.011	0.013





APPENDIX VIII-Modified Jones Average Absolute Discretionary Values

FTSE 100	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
NEGATIVE DA	0.037	0.034	0.041	0.044	1.370	0.041	0.042	0.029	0.026	1.664	0.037	0.054	0.040	0.026	0.028
POSITIVE DA	0.048	0.048	0.037	0.109	10.179	0.082	0.117	0.069	0.031	0.188	0.035	0.035	0.037	0.041	0.029
DIFFERENCE	0.011	0.014	-0.004	0.065	8.809	0.041	0.074	0.040	0.006	-1.476	-0.002	-0.019	-0.003	0.015	0.001
FTSE 250	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
NEGATIVE DA	0.071	0.068	0.068	0.063	0.066	0.052	0.049	0.057	0.045	0.048	0.050	0.054	0.048	0.040	0.043
POSITIVE DA	0.106	0.091	0.092	0.091	0.081	0.052	0.034	0.061	0.045	0.070	0.060	0.058	0.057	0.051	0.053
DIFFERENCE	0.035	0.023	0.024	0.028	0.015	0.000	-0.015	0.004	0.000	0.022	0.010	0.004	0.009	0.011	0.010
FTSE SMALL CAP	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
NEGATIVE DA	0.135	0.105	0.080	0.057	0.062	0.082	0.048	0.051	0.069	0.054	0.070	0.111	0.077	0.054	0.066
POSITIVE DA	0.090	0.087	0.111	0.089	0.073	0.066	0.048	0.059	0.053	0.082	0.055	0.507	0.066	0.065	0.063
DIFFERENCE	-0.044	-0.018	0.030	0.032	0.010	-0.016	0.000	0.008	-0.015	0.028	-0.015	0.396	-0.011	0.011	-0.003

APPENDIX IX-Modified Jones-Median Absolute Discretionary Values

FTSE 100	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
NEGATIVE DA	0.024	0.027	0.022	0.035	1.512	0.024	0.033	0.020	0.018	0.091	0.012	0.019	0.034	0.023	0.026
POSITIVE DA	0.015	0.034	0.026	0.029	0.951	0.015	0.035	0.026	0.024	0.175	0.019	0.026	0.021	0.035	0.025
DIFFERENCE	-0.009	0.007	0.004	-0.006	-0.561	-0.009	0.002	0.006	0.005	0.085	0.007	0.007	-0.013	0.012	-0.001
FTSE 250	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
NEGATIVE DA	0.056	0.047	0.055	0.039	0.050	0.043	0.035	0.042	0.035	0.039	0.036	0.043	0.038	0.034	0.034
POSITIVE DA	0.046	0.053	0.041	0.043	0.044	0.044	0.019	0.039	0.035	0.037	0.026	0.032	0.033	0.027	0.028
DIFFERENCE	-0.009	0.006	-0.014	0.004	-0.006	0.002	-0.016	-0.003	-0.001	-0.003	-0.010	-0.011	-0.005	-0.007	-0.007
FTSE SMALL CAP	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
NEGATIVE DA	0.047	0.069	0.053	0.037	0.045	0.053	0.035	0.037	0.032	0.039	0.069	0.116	0.052	0.041	0.040
POSITIVE DA	0.060	0.052	0.057	0.059	0.045	0.035	0.029	0.033	0.039	0.028	0.033	0.065	0.052	0.028	0.056
DIFFERENCE	0.013	-0.016	0.003	0.022	0.000	-0.018	-0.006	-0.004	0.007	-0.012	-0.036	-0.051	0.001	-0.012	0.016

APPENDIX X-Average REM-Abnormal Absolute Values-Abnormal Production Costs

FTSE100	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
NEGATIVE DA	0.23	0.20	0.85	0.17	0.19	0.14	0.15	0.17	0.14	0.15	0.18	0.18	0.17	0.14	0.12
POSITIVE DA	0.12	0.13	0.00	0.17	0.14	0.12	0.13	0.12	0.14	0.12	0.12	0.13	0.10	0.10	0.09
DIFFERENCE	(0.12)	(0.07)	(0.85)	(0.00)	(0.04)	(0.03)	(0.02)	(0.05)	(0.00)	(0.03)	(0.06)	(0.05)	(0.07)	(0.04)	(0.03)
FTSE 250	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
NEGATIVE DA	0.23	0.24	0.22	0.21	0.21	0.18	0.17	0.18	0.17	0.17	0.18	0.18	0.18	0.00	0.18
POSITIVE DA	0.16	0.16	0.17	0.18	0.15	0.13	0.14	0.15	0.13	0.15	0.14	0.13	0.13	0.91	0.13
DIFFERENCE	(0.07)	(0.07)	(0.05)	(0.03)	(0.06)	(0.06)	(0.03)	(0.03)	(0.04)	(0.02)	(0.03)	(0.05)	(0.04)	0.91	(0.05)
FTSE SMALL CAP	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
NEGATIVE DA	0.24	0.31	0.26	0.26	0.24	0.23	0.23	0.21	0.23	0.21	0.25	0.27	0.25	0.20	0.29
POSITIVE DA	0.26	0.24	0.31	0.17	0.17	0.17	0.16	0.15	0.15	0.17	0.17	0.20	0.16	0.14	0.16
DIFFERENCE	0.01	(0.07)	0.05	(0.09)	(0.07)	(0.06)	(0.07)	(0.06)	(0.08)	(0.04)	(0.08)	(0.07)	(0.10)	(0.06)	(0.13)

APPENDIX XI-Average REM-Abnormal Absolute Values-Abnormal Cash Flow

FTSE100	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
NEGATIVE DA	0.17	0.13	0.14	0.07	0.05	0.06	0.05	0.05	0.06	0.05	0.07	0.05	0.06	0.09	0.08
POSITIVE DA	0.07	0.07	0.00	0.08	0.09	0.06	0.07	0.07	0.06	0.05	0.05	0.06	0.04	0.05	0.04
DIFFERENCE	(0.10)	(0.06)	(0.14)	0.01	0.04	0.01	0.02	0.02	0.00	0.00	(0.02)	0.00	(0.02)	(0.04)	(0.03)
FTSE 250	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
NEGATIVE DA	0.07	0.07	0.08	0.08	0.07	0.05	0.06	0.06	0.07	0.06	0.08	0.10	0.11	0.11	0.10
POSITIVE DA	0.11	0.10	0.18	0.13	0.12	0.07	0.10	0.10	0.09	0.09	0.10	0.10	0.08	0.09	0.08
DIFFERENCE	0.04	0.03	0.10	0.05	0.05	0.02	0.03	0.04	0.02	0.02	0.02	(0.01)	(0.02)	(0.02)	(0.02)
FTSE SMALL CAP	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
NEGATIVE DA	0.17	0.13	0.14	0.07	0.05	0.06	0.05	0.05	0.06	0.05	0.07	0.05	0.06	0.09	0.08
POSITIVE DA	0.26	0.24	0.31	0.17	0.17	0.17	0.16	0.15	0.15	0.17	0.17	0.20	0.16	0.14	0.16
DIFFERENCE	0.08	0.11	0.16	0.11	0.12	0.11	0.11	0.10	0.09	0.12	0.10	0.15	0.09	0.05	0.08

APPENDIX XII-Average REM-Abnormal Absolute Values-Abnormal Discretionary Expenses

FTSE100	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
NEGATIVE DA	0.07	0.06	0.07	0.07	0.07	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.04
POSITIVE DA	0.26	0.27	0.24	0.23	0.25	0.18	0.18	0.18	0.18	0.19	0.18	0.20	0.13	0.13	0.13
DIFFERENCE	0.19	0.20	0.17	0.16	0.18	0.12	0.12	0.12	0.13	0.13	0.13	0.15	0.08	0.09	0.09
FTSE 250	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
NEGATIVE DA	0.00	0.08	0.09	0.09	0.08	0.07	0.07	0.07	0.07	0.07	0.06	0.00	0.06	0.05	0.00
POSITIVE DA	0.00	0.27	0.29	0.31	0.27	0.24	0.25	0.24	0.26	0.26	0.26	0.00	0.23	0.23	0.00
DIFFERENCE	0.00	0.19	0.20	0.22	0.19	0.17	0.17	0.16	0.19	0.19	0.19	0.00	0.18	0.19	0.00
FTSE SMALL CAP	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
NEGATIVE DA	0.20	0.17	0.17	0.14	0.13	0.13	0.12	0.12	0.11	0.10	0.09	0.09	0.08	0.08	0.08
POSITIVE DA	0.48	0.41	0.39	0.40	0.36	0.32	0.33	0.32	0.31	0.33	0.28	0.29	0.27	0.27	0.27
DIFFERENCE	0.28	0.24	0.22	0.26	0.22	0.20	0.21	0.20	0.20	0.23	0.19	0.20	0.19	0.19	0.18

APPENDIX XIII-Median REM-Abnormal Absolute Values- Abnormal Production Costs

FTSE100	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
NEGATIVE DA	0.20	0.17	0.76	0.15	0.15	0.10	0.17	0.16	0.11	0.12	0.16	0.15	0.14	0.13	0.08
POSITIVE DA	0.09	0.10	0.00	0.15	0.13	0.10	0.12	0.12	0.13	0.12	0.11	0.10	0.07	0.08	0.08
DIFFERENCE	(0.11)	(0.08)	(0.76)	(0.00)	(0.03)	0.00	(0.05)	(0.04)	0.01	0.00	(0.05)	(0.05)	(0.07)	(0.05)	(0.00)
FTSE 250	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
NEGATIVE DA	0.18	0.18	0.18	0.15	0.18	0.15	0.13	0.14	0.12	0.15	0.15	0.16	0.12	0.00	0.11
POSITIVE DA	0.14	0.16	0.12	0.10	0.12	0.10	0.12	0.12	0.09	0.12	0.10	0.09	0.09	0.72	0.10
DIFFERENCE	(0.03)	(0.02)	(0.06)	(0.04)	(0.06)	(0.05)	(0.01)	(0.01)	(0.02)	(0.03)	(0.06)	(0.07)	(0.03)	0.72	(0.01)
FTSE SMALL CAP	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
NEGATIVE DA	0.17	0.22	0.16	0.17	0.16	0.16	0.15	0.12	0.16	0.13	0.19	0.17	0.17	0.15	0.21
POSITIVE DA	0.14	0.15	0.16	0.14	0.15	0.13	0.11	0.13	0.14	0.16	0.15	0.18	0.14	0.12	0.17
DIFFERENCE	(0.03)	(0.07)	(0.00)	(0.03)	(0.01)	(0.02)	(0.05)	0.01	(0.02)	0.03	(0.04)	0.01	(0.03)	(0.03)	(0.03)

APPENDIX XIV-Median REM-Abnormal Absolute Values- Abnormal Cash Flow

FTSE100	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
NEGATIVE DA	0.05	0.04	0.10	0.04	0.05	0.04	0.05	0.05	0.04	0.05	0.04	0.04	0.04	0.04	0.03
POSITIVE DA	0.05	0.05	0.00	0.04	0.07	0.04	0.05	0.05	0.03	0.05	0.03	0.04	0.03	0.04	0.04
DIFFERENCE	0.00	0.01	(0.10)	0.00	0.02	(0.01)	(0.01)	0.00	(0.00)	0.00	(0.00)	0.00	(0.01)	(0.00)	0.01
FTSE 250	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
NEGATIVE DA	0.06	0.06	0.05	0.05	0.06	0.04	0.06	0.05	0.06	0.04	0.04	0.06	0.08	0.08	0.06
POSITIVE DA	0.07	0.07	0.08	0.09	0.08	0.05	0.06	0.07	0.07	0.05	0.05	0.05	0.04	0.04	0.03
DIFFERENCE	0.01	0.00	0.04	0.04	0.02	0.01	0.01	0.02	0.01	0.01	0.01	(0.01)	(0.03)	(0.04)	(0.03)
FTSE SMALL CAP	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
NEGATIVE DA	0.06	0.06	0.09	0.05	0.03	0.04	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
POSITIVE DA	0.06	0.05	0.06	0.05	0.07	0.05	0.04	0.04	0.04	0.07	0.05	0.05	0.05	0.04	0.04
DIFFERENCE	0.00	(0.01)	(0.03)	0.00	0.04	0.01	0.01	0.00	0.00	0.03	0.01	0.01	0.01	(0.00)	(0.01)

APPENDIX XV-Median REM-Abnormal Absolute Values- Abnormal Discretionary Expenses

FTSE100	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
NEGATIVE DA	0.06	0.06	0.06	0.05	0.06	0.05	0.06	0.05	0.04	0.06	0.04	0.05	0.05	0.04	0.04
POSITIVE DA	0.22	0.27	0.19	0.17	0.27	0.12	0.14	0.16	0.16	0.16	0.15	0.14	0.06	0.06	0.06
DIFFERENCE	0.16	0.21	0.13	0.11	0.21	0.06	0.08	0.11	0.12	0.11	0.11	0.08	0.01	0.02	0.03
FTSE 250	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
NEGATIVE DA	0.00	0.07	0.07	0.07	0.06	0.05	0.07	0.06	0.06	0.06	0.06	0.00	0.05	0.04	0.00
POSITIVE DA	0.00	0.19	0.21	0.20	0.19	0.18	0.20	0.17	0.16	0.17	0.17	0.00	0.17	0.16	0.00
DIFFERENCE	0.00	0.12	0.14	0.13	0.12	0.12	0.13	0.11	0.10	0.10	0.11	0.00	0.11	0.13	0.00
FTSE SMALL CAP	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
NEGATIVE DA	0.15	0.15	0.15	0.12	0.12	0.11	0.10	0.11	0.10	0.10	0.09	0.09	0.08	0.08	0.08
POSITIVE DA	0.31	0.31	0.27	0.36	0.31	0.26	0.28	0.23	0.23	0.29	0.26	0.24	0.22	0.23	0.21
DIFFERENCE	0.17	0.15	0.12	0.24	0.19	0.15	0.18	0.12	0.12	0.19	0.17	0.16	0.14	0.15	0.13

APPENDIX XVI: FTSE ALL SHARE Descriptive Statistics

FTSE ALL SHARE	Average	Median	Standard Deviation
Interest Cover	243.9814859	6.853088481	11470.53516
Leverage	0.197138805	0.162035853	0.20753113
Working Capital	1.25158072	0.973733583	6.87239196
Total Accruals	-0.037615572	-0.022356495	0.123676985
Operating Cycle	-6.112969289	16.50547381	248.7573525
Sales	£4,334,601,499	£349,481,000	
Total Assets	£6,102,978,193	£513,680,000	

APPENDIX XVII: FTSE 100 Descriptive Statistics

FTSE 100	Average	Median	Standard Deviation
Interest Cover	78.02816775	8.524814856	1790.031906
Leverage	0.248207395	0.228006053	0.185706735
Working Capital	0.993352483	0.9406969	0.938181148
Total Accruals	-0.033419282	-0.026944664	0.065946852
Operating Cycle	39.55582915	24.87483123	225.5101648
Sales	£19,667,802,584	£4,955,233,000	
Total Assets	£27,792,271,726	£6,112,000,000	

APPENDIX XVIII: FTSE 250 Descriptive Statistics

FTSE 250	Average	Median	Standard Deviation
Interest Cover	445.602734	6.544303797	16959.786
Leverage	0.203259473	0.15625553	0.20758138
Working Capital	1.22032528	0.968045899	2.171364232
Total Accruals	-0.035635227	-0.022353505	0.105169542
Operating Cycle	-73.35712198	14.41025685	3142.489754
Sales	£1,179,944,583	£1,960,600,000	
Total Assets	£1,879,183,276	£799,412,000	

APPENDIX XIX: FTSE Small Cap Descriptive Statistics

FTSE SMALL CAP	Average	Median	Standard Deviation
Interest Cover	75.58685212	6.023473028	1008.382692
Leverage	0.160914498	0.119891642	0.212424493
Working Capital	1.454185786	1.025250582	11.36808094
Total Accruals	-0.042753643	-0.017588421	0.164536082
Operating Cycle	55.83941854	15.23098827	1807.43413
Sales	£331,392,989	£155,983,000	
Total Assets	£1,089,988,291	£164,662,500	

APPENDIX XX-Interest Cover Positive vs negative residuals for Average AEM

AEM (JONES)	NEGATIVE	POSITIVE	DIFFERENCE	NEGATIVE	POSITIVE	DIFFERENCE	NEGATIVE	POSITIVE	DIFFERENCE
AVERAGE	FTSE 100	FTSE 100		FTSE 250	FTSE 250		FTSE SMALL CAP	FTSE SMALL CAP	
2004	21.33	21.52	-0.18	229.06	147.43	81.64	29.67	9.72	19.95
2005	13.82	41.52	-27.70	247.26	340.73	-93.47	208.46	94.37	114.09
2006	19.28	27.44	-8.17	89.28	390.25	-300.97	52.80	181.33	-128.54
2007	13.20	18.21	-5.01	87.95	41.45	46.50	130.22	32.95	97.27
2008	15.26	20.98	-5.73	100.35	67.20	33.14	30.73	190.06	-159.33
2009	11.17	28.13	-16.96	32.88	147.48	-114.60	22.48	103.33	-80.85
2010	24.84	50.75	-25.91	92.02	54.94	37.08	265.34	185.49	79.85
2011	20.96	25.04	-4.08	48.40	235.45	-187.05	35.21	69.03	-33.82
2012	4.08	56.78	-52.69	67.36	115.41	-48.05	54.09	56.76	-2.67
2013	11.50	25.99	-14.49	44.39	54.99	-10.60	52.09	440.65	-388.56
2014	13.61	72.42	-58.81	74.58	51.90	22.68	67.93	44.57	23.35
2015	11.59	112.56	-100.97	17.46	158.17	-140.72	35.84	15.52	20.31
2016	8.92	36.98	-28.06	127.58	82.28	45.30	323.26	25.42	297.84
2017	12.46	89.83	-77.37	94.69	93.28	1.41	408.59	47.79	360.79
2018	15.49	71.47	-55.98	98.67	115.96	-17.29	85.06	78.82	6.25

APPENDIX XXI-Working Capital Positive vs negative residuals for Average AEM

AEM (JONES)	NEGATIVE	POSITIVE		NEGATIVE	POSITIVE		NEGATIVE	POSITIVE	
AVERAGE	FTSE 100	FTSE 100	Difference	FTSE 250	FTSE 250	Difference	FTSE SMALL CAP	FTSE SMALL CAP	Difference
2004	1.29	1.33	-0.04	1.56	3.38	-1.82	1.70	2.25	-0.55
2005	1.18	1.82	-0.65	1.48	2.35	-0.87	1.68	1.74	-0.06
2006	1.33	1.68	-0.35	2.23	1.80	0.42	1.84	2.20	-0.37
2007	1.46	1.68	-0.21	1.79	1.68	0.11	1.71	1.77	-0.07
2008	1.25	0.89	0.36	1.47	2.23	-0.76	1.53	1.73	-0.19
2009	7.81	1.26	6.55	1.59	1.71	-0.12	1.73	1.73	0.00
2010	1.07	1.71	-0.65	1.65	1.68	-0.02	1.64	1.59	0.05
2011	1.39	1.39	0.01	1.38	2.43	-1.05	1.93	1.65	0.28
2012	1.31	1.42	-0.11	1.32	2.00	-0.68	1.54	4.05	-2.51
2013	20.99	1.34	19.65	1.45	2.01	-0.56	1.48	1.65	-0.17
2014	1.32	1.39	-0.06	1.63	1.86	-0.23	1.44	1.72	-0.28
2015	1.21	1.54	-0.33	1.55	1.79	-0.24	1.64	1.44	0.20
2016	1.17	1.39	-0.22	1.61	2.00	-0.39	1.79	1.63	0.16
2017	1.15	1.53	-0.38	1.68	1.69	-0.01	1.48	2.16	-0.68
2018	1.18	1.40	-0.23	1.53	1.83	-0.30	2.08	1.73	0.35

APPENDIX XXII- Interest Cover Positive vs negative residuals for Median AEM

AEM (JONES)	NEGATIVE	POSITIVE	DIFFERENCE	NEGATIVE	POSITIVE	DIFFERENCE	NEGATIVE	POSITIVE	DIFFERENCE
MEDIAN	FTSE 100	FTSE 100		FTSE 250	FTSE 250		FTSE SMALL CAP	FTSE SMALL CAP	
2004	8.70	29.67	-20.97	10.48	9.83	0.65	9.36	12.04	-2.68
2005	6.64	16.14	-9.51	11.98	8.97	3.00	1.34	1.58	-0.24
2006	7.80	9.19	-1.39	8.72	9.17	-0.45	10.32	10.01	0.31
2007	8.86	16.48	-7.62	9.31	9.98	-0.67	21.31	7.60	13.71
2008	7.99	8.22	-0.23	5.86	11.66	-5.80	7.37	6.50	0.87
2009	8.90	12.93	-4.04	8.80	7.94	0.85	8.22	6.64	1.59
2010	9.34	9.58	-0.24	13.36	9.95	3.41	13.44	11.86	1.59
2011	11.64	19.71	-8.07	9.54	20.60	-11.06	10.02	11.20	-1.17
2012	12.09	59.75	-47.65	11.29	19.37	-8.08	12.68	12.51	0.17
2013	37.84	9.88	27.95	9.97	15.57	-5.61	11.85	9.75	2.10
2014	9.70	17.53	-7.83	11.50	11.27	0.24	11.48	13.07	-1.59
2015	9.93	28.39	-18.46	9.68	13.79	-4.12	13.51	10.21	3.30
2016	7.88	46.33	-38.44	9.15	15.55	-6.41	9.58	19.96	-10.38
2017	10.22	60.55	-50.33	11.46	18.58	-7.12	11.49	24.10	-12.61
2018	9.77	18.89	-9.12	11.69	12.92	-1.23	16.85	14.60	2.25

APPENDIX XXIII- Working Capital Positive vs negative residuals for Median AEM

AEM (JONES)	NEGATIVE	POSITIVE		NEGATIVE	POSITIVE		NEGATIVE	POSITIVE	
MEDIAN	FTSE 100	FTSE 100	Difference	FTSE 250	FTSE 250	Difference	FTSE SMALL CAP	FTSE SMALL CAP	Difference
2004	1.19	1.10	0.09	1.24	1.69	-0.45	1.40	1.31	0.09
2005	0.98	1.21	-0.23	1.33	1.40	-0.07	1.58	1.34	0.24
2006	1.05	1.33	-0.28	1.27	1.37	-0.10	1.36	1.42	-0.06
2007	1.18	1.26	-0.09	1.33	1.42	-0.09	1.44	1.39	0.05
2008	1.13	0.98	0.14	1.11	1.59	-0.48	1.28	1.49	-0.20
2009	6.88	1.17	5.71	1.28	1.24	0.04	1.42	1.27	0.14
2010	1.18	1.59	-0.41	1.11	1.54	-0.43	1.52	1.41	0.10
2011	1.08	1.35	-0.27	1.04	1.66	-0.62	1.28	1.53	-0.24
2012	1.08	1.31	-0.23	1.12	1.40	-0.28	1.30	1.50	-0.20
2013	19.37	1.42	17.95	1.17	1.53	-0.36	1.34	1.51	-0.16
2014	1.13	1.37	-0.24	1.15	1.56	-0.41	1.30	1.39	-0.09
2015	1.05	1.35	-0.30	1.19	1.40	-0.22	1.44	1.41	0.03
2016	1.04	1.36	-0.32	1.23	1.47	-0.24	1.23	1.61	-0.38
2017	0.98	1.38	-0.40	1.16	1.36	-0.20	1.31	1.59	-0.28
2018	1.01	1.41	-0.40	1.20	1.30	-0.10	1.40	1.54	-0.14

APPENDIX XXIV-Interest Cover Positive vs Negative residuals for Average REM Abnormal Production

REM ABN PROD	POSITIVE	NEGATIVE		POSITIVE	NEGATIVE		POSITIVE	NEGATIVE	
AVERAGE	FTSE 100	FTSE 100	DIFFERENCE	FTSE 250	FTSE 250	DIFFERENCE	FTSE SMALL CAP	FTSE SMALL CAP	DIFFERENCE
2004	15.24	21.22	(5.98)	9.27	28.55	(19.28)	27.35	20.32	7.03
2005	15.73	25.56	(9.83)	13.99	23.96	(9.98)	23.01	31.52	(8.51)
2006	0.00	22.51	(22.51)	12.89	22.93	(10.04)	14.23	12.99	1.25
2007	15.97	18.49	(2.53)	11.79	24.24	(12.45)	15.74	19.91	(4.17)
2008	5.15	11.26	(6.12)	10.30	18.17	(7.87)	7.73	19.96	(12.22)
2009	11.59	15.35	(3.77)	21.51	18.28	3.23	17.72	19.19	(1.47)
2010	11.29	16.41	(5.12)	23.65	32.57	(8.92)	16.55	28.69	(12.15)
2011	10.39	24.75	(14.37)	7.27	57.24	(49.96)	12.11	24.10	(12.00)
2012	12.51	22.18	(9.66)	20.98	29.59	(8.61)	13.22	46.58	(33.37)
2013	11.36	18.32	(6.96)	15.93	21.61	(5.68)	12.26	28.65	(16.39)
2014	16.58	17.45	(0.87)	15.48	21.60	(6.12)	13.47	31.96	(18.49)
2015	13.44	18.04	(4.60)	24.27	20.67	3.59	10.13	20.39	(10.26)
2016	14.06	15.46	(1.40)	26.64	22.48	4.16	11.64	36.37	(24.73)
2017	20.87	35.39	(14.51)	18.20	23.99	(5.79)	16.66	23.50	(6.84)
2018	14.63	33.16	(18.52)	28.23	21.71	6.52	14.23	26.79	(12.56)

APPENDIX XXV- Interest Cover Positive vs Negative residuals for Median REM Abnormal Production

MEDIAN	POSITIVE	NEGATIVE		POSITIVE	NEGATIVE		POSITIVE	NEGATIVE	
REM ABN PROD	FTSE 100	FTSE 100	DIFFERENCE	FTSE 250	FTSE 250	DIFFERENCE	FTSE SMALL CAP	FTSE SMALL CAP	DIFFERENCE
2004	10.37	17.06	(6.69)	5.72	11.09	(5.36)	9.36	11.38	(2.03)
2005	8.46	10.81	(2.35)	7.69	11.85	(4.16)	6.97	12.24	(5.27)
2006	0.00	9.19	(9.19)	6.69	12.14	(5.44)	7.66	10.01	(2.35)
2007	7.63	11.65	(4.02)	7.87	10.17	(2.30)	7.74	9.62	(1.89)
2008	4.66	8.24	(3.58)	4.80	8.81	(4.01)	6.18	8.23	(2.05)
2009	5.36	10.88	(5.52)	6.63	6.90	(0.28)	5.47	11.24	(5.77)
2010	7.07	12.95	(5.88)	9.48	16.27	(6.79)	7.46	14.90	(7.44)
2011	8.39	14.04	(5.65)	8.80	12.10	(3.30)	8.61	11.79	(3.18)
2012	5.31	14.55	(9.24)	8.91	11.34	(2.44)	8.62	13.17	(4.55)
2013	5.48	14.46	(8.98)	9.95	10.91	(0.97)	7.76	12.52	(4.76)
2014	7.83	12.23	(4.40)	9.55	12.30	(2.75)	8.01	14.74	(6.74)
2015	8.64	15.70	(7.06)	9.51	11.24	(1.74)	7.85	14.54	(6.69)
2016	7.22	10.37	(3.15)	7.25	10.11	(2.86)	9.63	16.71	(7.08)
2017	9.49	13.84	(4.35)	9.44	11.67	(2.23)	9.93	15.95	(6.01)
2018	7.84	14.89	(7.05)	7.89	12.02	(4.13)	10.72	21.90	(11.18)

APPENDIX XXVI- Working Capital Positive vs Negative residuals for Average REM Abnormal Production

REM ABN PROD	POSITIVE	NEGATIVE		POSITIVE	NEGATIVE		POSITIVE	NEGATIVE	
AVERAGE	FTSE 100	FTSE 100	DIFFERENCE	FTSE 250	FTSE 250	DIFFERENCE	FTSE SMALL CAP	FTSE SMALL CAP	DIFFERENCE
2004	1.290	1.353	(0.063)	1.633	1.750	(0.117)	1.666	1.821	(0.155)
2005	1.373	1.501	(0.128)	1.499	1.594	(0.095)	1.863	1.610	0.253
2006	0.00	1.4	(-1.4)	1.574	1.751	(0.177)	1.657	1.786	(0.129)
2007	1.533	1.312	0.220	1.550	1.621	(0.071)	1.768	1.691	0.077
2008	1.234	1.198	0.036	1.624	1.650	(0.026)	1.639	1.613	0.026
2009	1.383	1.302	0.081	1.333	1.903	(0.570)	1.42	1.54	(0.12)
2010	1.415	1.344	0.071	1.613	1.734	(0.121)	1.783	1.445	0.338
2011	1.428	1.267	0.161	1.613	1.897	(0.284)	1.998	1.563	0.435
2012	1.427	1.293	0.134	1.564	1.742	(0.178)	1.508	1.670	(0.162)
2013	1.430	1.272	0.158	1.533	1.779	(0.246)	1.817	1.587	0.230
2014	1.480	1.213	0.267	1.642	1.775	(0.134)	1.627	1.458	0.169
2015	1.416	1.243	0.173	1.663	1.634	0.029	1.582	1.684	(0.102)
2016	1.385	1.114	0.271	1.793	1.670	0.123	1.844	1.562	0.282
2017	1.417	1.146	0.271	1.722	1.643	0.079	1.660	1.574	0.086
2018	1.269	1.312	(0.043)	1.663	1.700	(0.038)	2.183	1.556	0.626

APPENDIX XXVII- Working Capital Positive vs Negative residuals for Median REM Abnormal Production

REM ABN PROD	POSITIVE	NEGATIVE		POSITIVE	NEGATIVE		POSITIVE	NEGATIVE	
MEDIAN	FTSE 100	FTSE 100	DIFFERENCE	FTSE 250	FTSE 250	DIFFERENCE	FTSE SMALL CAP	FTSE SMALL CAP	DIFFERENCE
2004	1.083	1.228	(0.145)	1.162	1.400	(0.238)	1.313	1.314	(0.001)
2005	1.156	1.151	0.005	1.243	1.403	(0.160)	1.566	1.369	0.197
2006	0.000	1.197	(1.197)	1.173	1.507	(0.333)	1.402	1.375	0.027
2007	1.223	1.111	0.112	1.287	1.335	(0.048)	1.542	1.357	0.185
2008	1.126	0.982	0.144	1.157	1.404	(0.247)	1.469	1.236	0.233
2009	1.246	1.172	0.074	1.092	1.521	(0.429)	1.191	1.366	(0.175)
2010	1.287	1.136	0.151	1.146	1.454	(0.308)	1.515	1.377	0.139
2011	1.331	1.093	0.239	1.161	1.478	(0.317)	1.495	1.421	0.074
2012	1.183	1.106	0.077	1.322	1.257	0.065	1.242	1.364	(0.121)
2013	1.287	1.128	0.158	1.214	1.531	(0.317)	1.333	1.438	(0.105)
2014	1.211	1.104	0.107	1.277	1.469	(0.192)	1.280	1.444	(0.164)
2015	1.325	1.233	0.093	1.330	1.291	0.039	1.456	1.454	0.002
2016	1.180	1.042	0.137	1.338	1.407	(0.069)	1.470	1.278	0.191
2017	1.220	1.136	0.084	1.294	1.340	(0.047)	1.251	1.371	(0.120)
2018	1.029	1.276	(0.247)	1.092	1.355	(0.264)	1.513	1.502	0.011

APPENDIX XXVIII-Interest Cover positive vs negative residuals Average Abnormal Cash flows

REM ABN CASH FLOW	POSITIVE	NEGATIVE		POSITIVE	NEGATIVE		POSITIVE	NEGATIVE	
AVERAGE	FTSE 100	FTSE 100	DIFFERENCE	FTSE 250	FTSE 250	DIFFERENCE	FTSE SMALL CAP	FTSE SMALL CAP	DIFFERENCE
2004	21.34	19.75	1.59	24.14	12.76	11.38	26.52	34.76	(8.24)
2005	25.84	25.37	0.47	26.81	14.34	12.47	50.23	22.86	27.37
2006	0.00	23.5	(23.5)	17.59	23.80	(6.21)	35.96	11.99	23.97
2007	21.55	41.11	(19.56)	18.94	21.60	(2.66)	52.71	32.00	20.71
2008	14.83	22.37	(7.54)	23.59	7.48	16.11	40.22	11.51	28.71
2009	20.81	18.71	2.10	27.58	7.28	20.30	30.69	32.52	(1.83)
2010	17.05	10.45	6.60	33.65	21.79	11.85	58.63	42.65	15.98
2011	21.11	10.08	11.03	29.20	33.21	(4.01)	31.70	53.68	(21.98)
2012	22.25	9.36	12.89	30.95	18.20	12.74	44.47	27.48	16.99
2013	26.25	11.20	15.05	36.65	28.18	8.47	30.31	49.28	(18.97)
2014	23.06	14.18	8.88	23.35	28.73	(5.38)	27.04	27.93	(0.89)
2015	20.05	11.58	8.47	24.60	32.67	(8.07)	37.34	7.22	30.12
2016	16.89	11.40	5.49	20.06	33.74	(13.67)	31.08	11.63	19.46
2017	23.14	15.42	7.72	21.79	38.82	(17.03)	38.34	22.46	15.88
2018	22.47	11.16	11.31	20.44	36.69	(16.25)	26.44	26.12	0.31

APPENDIX XXIX- Interest Cover positive vs negative residuals Median Abnormal Cash flows

REM ABN CASH FLOW	POSITIVE	NEGATIVE		POSITIVE	NEGATIVE		POSITIVE	NEGATIVE	
MEDIAN	FTSE 100	FTSE 100	DIFFERENCE	FTSE 250	FTSE 250	DIFFERENCE	FTSE SMALL CAP	FTSE SMALL CAP	DIFFERENCE
2004	8.88	11.18	(2.29)	10.97	6.09	4.88	9.76	8.23	1.53
2005	11.52	7.03	4.49	13.05	6.42	6.63	8.82	7.06	1.76
2006	0.00	9.15	(9.15)	10.07	7.06	3.01	10.17	7.15	3.02
2007	11.15	7.59	3.56	11.93	7.60	4.34	10.49	7.81	2.68
2008	11.76	4.90	6.86	9.41	4.15	5.26	9.02	5.91	3.11
2009	9.00	5.30	3.70	11.19	2.82	8.37	8.82	5.47	3.34
2010	14.70	7.87	6.83	19.64	8.91	10.74	13.20	7.46	5.74
2011	12.21	8.40	3.81	12.10	7.77	4.33	10.47	10.64	(0.17)
2012	12.95	5.17	7.78	12.17	8.99	3.18	12.68	8.52	4.16
2013	14.46	6.15	8.31	10.89	11.35	(0.45)	15.52	8.84	6.68
2014	16.24	7.95	8.29	11.59	10.50	1.09	17.58	7.61	9.97
2015	15.24	9.39	5.85	10.59	11.38	(0.80)	15.88	6.95	8.93
2016	11.52	7.71	3.81	9.35	9.03	0.33	16.71	7.81	8.90
2017	16.71	8.75	7.96	10.39	9.16	1.23	18.36	9.18	9.18
2018	16.34	7.06	9.28	10.15	8.12	2.04	21.63	13.18	8.45

APPENDIX XXX-Working Capital Positive vs Negative residuals for Average REM Abnormal Cash Flows

REM ABN CASH FLOW	POSITIVE	NEGATIVE		POSITIVE	NEGATIVE		POSITIVE	NEGATIVE	
AVERAGE	FTSE 100	FTSE 100	DIFFERENCE	FTSE 250	FTSE 250	DIFFERENCE	FTSE SMALL CAP	FTSE SMALL CAP	DIFFERENCE
2004	1.307	1.409	(0.103)	1.531	3.064	(1.533)	1.579	2.634	(1.055)
2005	1.460	1.414	0.045	1.499	2.330	(0.832)	1.711	1.889	(0.178)
2006	0.000	1.142	1.142	1.844	2.205	(0.360)	1.681	2.245	(0.564)
2007	1.435	1.417	0.019	1.459	2.016	(0.557)	1.846	1.620	0.226
2008	1.119	1.311	(0.191)	1.401	2.299	(0.899)	1.557	1.679	(0.123)
2009	1.285	1.404	(0.118)	1.557	1.765	(0.208)	1.594	1.881	(0.287)
2010	1.370	1.403	(0.033)	1.451	1.893	(0.442)	1.702	1.525	0.177
2011	1.302	1.390	(0.088)	1.882	1.804	0.079	1.542	2.032	(0.490)
2012	1.266	1.454	(0.188)	1.559	1.773	(0.214)	4.333	1.576	2.758
2013	1.229	1.466	(0.236)	1.571	1.789	(0.218)	1.575	1.795	(0.220)
2014	1.258	1.479	(0.221)	1.580	1.901	(0.320)	1.393	1.666	(0.273)
2015	1.241	1.445	(0.204)	1.643	1.683	(0.040)	1.695	1.525	0.171
2016	1.204	1.399	(0.195)	1.580	1.956	(0.375)	2.069	1.451	0.618
2017	1.220	1.369	(0.149)	1.744	1.600	0.144	1.892	1.650	0.242
2018	1.422	1.093	0.329	1.663	1.667	(0.004)	2.372	1.627	0.745

APPENDIX XXXI- Working Capital Positive vs Negative residuals for Median REM Abnormal Cash Flows

REM ABN CASH FLOW	POSITIVE	NEGATIVE		POSITIVE	NEGATIVE		POSITIVE	NEGATIVE	
MEDIAN	FTSE 100	FTSE 100	DIFFERENCE	FTSE 250	FTSE 250	DIFFERENCE	FTSE SMALL CAP	FTSE SMALL CAP	DIFFERENCE
2004	1.105	1.239	(0.133)	1.299	1.315	(0.016)	1.306	1.503	(0.196)
2005	1.104	1.179	(0.074)	1.335	1.393	(0.059)	1.351	1.392	(0.041)
2006	0.00	0.985	(0.985)	1.302	1.384	(0.081)	1.278	1.522	(0.244)
2007	0.981	1.263	(0.283)	1.220	1.362	(0.142)	1.382	1.441	(0.059)
2008	0.967	1.289	(0.323)	1.184	1.401	(0.217)	1.565	1.487	0.078
2009	1.140	1.269	(0.128)	1.322	1.118	0.204	1.332	1.366	(0.034)
2010	1.253	1.199	0.054	1.287	1.302	(0.015)	1.614	1.263	0.351
2011	1.131	1.244	(0.113)	1.161	1.380	(0.219)	1.554	1.444	0.110
2012	1.128	1.181	(0.053)	1.193	1.364	(0.171)	1.476	1.382	0.094
2013	1.113	1.287	(0.173)	1.412	1.247	0.165	1.438	1.340	0.098
2014	1.104	1.306	(0.201)	1.175	1.618	(0.443)	1.266	1.407	(0.141)
2015	1.131	1.337	(0.205)	1.265	1.695	(0.430)	1.524	1.401	0.122
2016	1.042	1.399	(0.357)	1.276	1.475	(0.198)	1.582	1.278	0.303
2017	0.988	1.232	(0.243)	1.163	1.386	(0.223)	1.369	1.536	(0.167)
2018	1.133	0.994	0.138	1.199	1.293	(0.095)	1.452	1.513	(0.061)

APPENDIX XXXII-Working Capital Positive vs Negative residuals for Average REM Abnormal Discretionary Expenses

REM ABN DISC EXPENSES	Positive	Negative		Positive	Negative		Positive	Negative	
Average	FTSE 100	FTSE100	DIFFERENCE	FTSE 250	FTSE 250	DIFFERENCE	FTSE SMALL CAP	FTSE SMALL CAP	DIFFERENCE
2004	1.4935298	1.266869	0.2266607	1.8901976	2.365468	-0.4752703	3.4096837	1.3292335	2.0804502
2005	1.5528001	1.3956391	0.157161	1.6462746	1.9531782	-0.3069036	2.25383775	1.5724156	0.6814221
2006	1.3387176	1.5869111	-0.2481935	1.9052678	2.116949	-0.2116812	3.04859475	1.4632114	1.5853833
2007	1.1733102	1.5856944	-0.4123842	1.7282183	1.7459032	-0.0176849	2.25432775	1.5020498	0.7522779
2008	1.0724041	1.3189619	-0.2465578	1.7119013	1.8830266	-0.1711253	2.04225654	1.4064651	0.6357915
2009	1.2261229	1.4211652	-0.1950424	1.653395	1.653395	0	2.23248011	1.4752511	0.7572291
2010	1.2430508	1.4562941	-0.2132433	1.8912525	1.5635541	0.3276984	1.99615313	1.4321178	0.5640353
2011	1.2461602	1.4066471	-0.1604869	1.8951385	1.8183881	0.0767504	1.83799972	1.7688385	0.0691612
2012	1.2927389	1.4022781	-0.1095392	1.9261966	1.55723	0.3689666	1.7833405	3.4544382	-1.6710977
2013	1.1988954	1.4562508	-0.2573555	1.8409959	1.6127006	0.2282952	1.75458596	1.6700538	0.0845322
2014	1.259644	1.4239599	-0.164316	2.0335623	1.6310587	0.4025036	1.49989855	1.5351081	-0.0352096
2015	1.2646256	1.3774167	-0.1127912	1.889972	1.5820504	0.3079216	1.79016524	1.5056331	0.2845321
2016	1.166398	1.342545	-0.176147	1.6965367	1.7501818	-0.0536451	1.69963349	1.6736401	0.0259934
2017	1.1336021	1.3767367	-0.2431346	1.7114122	1.6745986	0.0368136	1.89859582	1.7181758	0.1804201
2018	1.0561926	1.5169425	-0.4607499	1.6382029	1.6789852	-0.0407823	1.76882887	1.916992	-0.1481631

APPENDIX XXXIII- Working Capital Positive vs Negative residuals for Median REM Abnormal Discretionary Expenses

REM ABN DISC EXPENSES	Positive	Negative		Positive	Negative		Positive	Negative	
MEDIAN	FTSE 100	FTSE100	DIFFERENCE	FTSE 250	FTSE 250	DIFFERENCE	FTSE SMALL CAP	FTSE SMALL CAP	DIFFERENCE
2004	1.2770694	1.0699899	0.2070795	1.554193	1.195724	0.3584691	1.91983351	1.2329281	0.6869054
2005	1.3451215	1.0323515	0.31277	1.4548688	1.2146671	0.2402017	1.6083011	1.3145675	0.2937336
2006	1.4172465	1.0482857	0.3689607	1.5517065	1.2422907	0.3094157	1.53076172	1.3363194	0.1944423
2007	1.2524598	1.0962031	0.1562567	1.4994364	1.1895655	0.3098709	1.45114497	1.3339262	0.1172187
2008	1.0454918	1.1046253	-0.0591335	1.5558985	1.1362991	0.4195994	1.47175985	1.288854	0.1829058
2009	1.2871884	1.1720648	0.1151237	1.2759772	1.2759772	0	1.62202247	1.2115702	0.4104522
2010	1.2534	1.1275583	0.1258418	1.5485498	1.1283142	0.4202356	1.72268369	1.2686018	0.4540819
2011	1.231196	1.1310236	0.1001725	1.6298189	1.1609552	0.4688636	1.69603321	1.3015827	0.3944505
2012	1.2323717	1.1465567	0.085815	1.7166026	1.136685	0.5799176	1.62333455	1.3210911	0.3022435
2013	1.1806102	1.2289959	-0.0483857	1.7121708	1.1795214	0.5326494	1.50142572	1.3060403	0.1953854
2014	1.1704217	1.199789	-0.0293672	1.816522	1.1745337	0.6419883	1.45254692	1.2731678	0.1793792
2015	1.2362674	1.2735548	-0.0372874	1.7345455	1.2280344	0.5065111	1.5235344	1.4129754	0.110559
2016	1.064671	1.1761942	-0.1115231	1.5940322	1.2161354	0.3778967	1.47767188	1.2784974	0.1991745
2017	1.0106312	1.2163802	-0.205749	1.5342873	1.1969612	0.3373262	1.85384615	1.3308649	0.5229812
2018	0.9145381	1.1896274	-0.2750894	1.3740844	1.2045675	0.1695168	1.56538628	1.385879	0.1795072

APPENDIX XXXIV-Interest Cover positive vs negative residuals Average Abnormal Discretionary Expenses

REM ABN DISC EXPENSES	Positive	Negative	Difference	Positive	Negative	Difference	Positive	Negative	Difference
Average	FTSE 100	FTSE 100		FTSE 250	FTSE 250		FTSE Small Cap	FTSE Small Cap	
2004	106.87	17.89	88.99	205.81	139.71	66.10	50.09	54.76	-4.67
2005	42.22	18.33	23.90	42.90	138.60	-95.70	14.73	229.15	-214.41
2006	23.40	22.80	0.59	160.81	102.19	58.62	36.93	139.49	-102.56
2007	67.64	20.22	47.43	62.95	14.92	48.02	67.32	55.46	11.86
2008	82.47	17.09	65.38	54.08	51.34	2.75	219.37	164.40	54.97
2009	38.69	13.21	25.48	91.35	91.35	0.00	120.67	57.03	63.64
2010	33.80	17.19	16.61	174.91	27.49	147.42	50.58	267.89	-217.31
2011	21.09	15.97	5.13	127.13	31.83	95.29	54.08	47.07	7.01
2012	58.89	13.57	45.32	63.60	54.76	8.84	67.63	36.31	31.32
2013	25.22	14.36	10.86	66.70	39.47	27.23	66.71	301.36	-234.64
2014	79.80	16.81	63.00	105.35	45.48	59.88	75.03	27.82	47.21
2015	96.42	23.59	72.83	187.66	40.26	147.40	21.21	498.98	-477.77
2016	29.11	35.15	-6.04	242.24	62.44	179.81	37.89	187.85	-149.96
2017	41.58	47.44	-5.86	89.92	91.07	-1.15	21.01	281.50	-260.49
2018	28.55	58.88	-30.33	78.53	87.57	-9.04	65.52	87.30	-21.78

APPENDIX XXXV-Interest Cover positive vs negative residuals Median Abnormal Discretionary Expenses

REM ABN DISC EXPENSES	Positive	Negative	Difference	Positive	Negative	Difference	Positive	Negative	Difference
Median	FTSE 100	FTSE 100		FTSE 250	FTSE 250		FTSE Small Cap	FTSE Small Cap	
2004	24.23	10.75	13.48	10.48	9.94	0.54	15.41	10.48	4.93
2005	17.78	8.46	9.32	7.97	8.47	(0.50)	10.19	11.89	(1.69)
2006	10.48	7.37	3.11	7.96	8.17	(0.20)	7.71	10.32	(2.61)
2007	11.93	9.13	2.81	8.25	9.90	(1.66)	14.88	7.94	6.94
2008	9.00	8.22	0.78	6.39	6.12	0.27	11.49	7.13	4.36
2009	11.49	7.60	3.89	7.76	7.76	-	9.93	8.87	1.06
2010	15.49	9.24	6.25	16.02	11.43	4.59	18.51	8.93	9.59
2011	13.19	9.81	3.37	11.00	10.33	0.66	15.39	9.79	5.60
2012	15.96	8.97	7.00	11.78	11.22	0.56	48.93	9.85	39.08
2013	14.70	9.37	5.33	12.41	10.84	1.57	24.08	9.77	14.31
2014	15.64	9.27	6.37	17.39	11.62	5.77	36.53	9.71	26.82
2015	15.70	9.21	6.48	12.59	9.50	3.09	15.83	10.25	5.58
2016	10.37	9.17	1.20	13.70	9.15	4.55	13.79	10.76	3.02
2017	13.06	12.01	1.05	14.46	11.51	2.95	15.59	16.28	(0.69)
2018	10.79	11.61	(0.83)	13.41	9.60	3.81	21.53	14.79	6.75

APPENDIX XXXVI- Positive vs Negative Residuals AEM for Average Operating Cycle

AEM (JONES)	FTSE 100			FTSE 250			FTSE SMALL CAP		
AVERAGE	POSITIVE	NEGATIVE	DIFFERENCE	POSITIVE	NEGATIVE	DIFFERENCE	POSITIVE	NEGATIVE	DIFFERENCE
2004	55.99	82.04	-26.05	108.26	28.16	80.10	173.25	50.98	122.27
2005	78.15	60.06	18.09	25.70	44.95	-19.25	139.97	55.09	84.91
2006	65.01	60.09	4.92	80.20	58.52	21.68	52.67	56.48	-3.81
2007	179.60	57.60	122.00	116.80	50.34	66.46	52.39	59.16	-6.76
2008	30.38	71.21	-40.83	92.54	73.02	19.52	67.08	62.03	5.05
2009	83.72	59.11	24.61	82.17	33.60	48.57	42.00	63.73	-21.73
2010	149.00	65.24	83.76	92.75	69.72	23.02	50.16	70.42	-20.25
2011	185.36	81.85	103.50	131.91	49.08	82.82	45.21	70.14	-24.93
2012	27.40	42.38	-14.98	140.40	45.46	94.93	72.81	47.50	25.31
2013	19.33	33.90	-14.57	122.61	39.26	83.35	180.41	55.39	125.02
2014	38.16	27.10	11.05	114.39	52.70	61.69	188.15	50.83	137.33
2015	43.27	45.37	-2.09	114.44	56.14	58.30	72.39	54.77	17.62
2016	45.39	47.48	-2.09	129.57	66.76	62.81	84.99	36.82	48.17
2017	111.61	44.47	67.14	99.39	63.66	35.74	108.41	50.60	57.81
2018	90.60	50.91	39.69	105.96	53.91	52.06	120.39	35.98	84.41

APPENDIX XXXVII-Positive vs Negative Residuals AEM for Median Operating Cycle

AEM (JONES)	FTSE 100			FTSE 250			FTSE SMALL CAP		
MEDIAN	POSITIVE	NEGATIVE	DIFFERENCE	POSITIVE	NEGATIVE	DIFFERENCE	POSITIVE	NEGATIVE	DIFFERENCE
2004	43.20	59.48	-16.28	75.27	43.82	31.45	50.48	53.87	-3.39
2005	58.49	50.58	7.92	77.65	44.95	32.70	61.86	52.48	9.38
2006	47.03	48.49	-1.46	60.84	58.52	2.32	49.57	53.44	-3.86
2007	91.22	45.64	45.58	91.54	50.34	41.21	60.88	52.97	7.91
2008	40.20	54.54	-14.35	90.45	40.12	50.33	53.95	57.46	-3.51
2009	58.36	58.36	0.00	66.94	55.70	11.23	50.24	69.11	-18.87
2010	31.74	52.86	-21.13	71.04	49.89	21.14	58.22	51.94	6.28
2011	45.54	54.37	-8.82	97.22	38.40	58.83	54.25	63.19	-8.94
2012	54.60	45.39	9.21	62.04	48.95	13.09	64.35	46.33	18.02
2013	48.71	33.90	14.81	88.36	36.74	51.62	73.69	61.12	12.57
2014	42.15	31.35	10.80	77.47	44.60	32.87	81.58	49.53	32.05
2015	46.56	32.40	14.16	75.90	48.95	26.95	52.09	56.03	-3.94
2016	55.33	38.47	16.86	93.04	50.90	42.14	85.08	49.02	36.05
2017	41.22	40.21	1.01	82.97	45.13	37.83	80.85	61.41	19.43
2018	44.62	52.93	-8.30	98.27	41.42	56.85	78.07	73.06	5.00

APPENDIX XXXVIII- Positive vs Negative Residuals AEM for Average Net Operating Assets

AVERAGE	FTSE 100			FTSE 100		
AEM (JONES)	POSITIVE NOA	POSITIVE NOA	DIFFERENCE	NEGATIVE NOA	NEGATIVE NOA	DIFFERENCE
2004	0.0454	0.0449	0.0004	-0.0310	-0.0381	0.0071
2005	0.0423	0.0432	-0.0009	-0.0307	0.0000	-0.0307
2006	0.0409	0.0491	-0.0082	-0.0339	-0.0396	0.0057
2007	0.1307	0.1308	-0.0001	-0.0433	0.0000	-0.0433
2008	0.6081	10.0964	-9.4883	-0.0693	-1.3591	1.2899
2009	0.0864	0.0779	0.0085	-0.0400	-0.0519	0.0119
2010	0.1097	0.1167	-0.0070	-0.0434	-0.0522	0.0088
2011	0.0533	0.0563	-0.0029	-0.0287	-0.0337	0.0050
2012	0.0311	0.0345	-0.0035	-0.0261	-0.0277	0.0015
2013	0.1909	0.2460	-0.0550	-1.6867	-1.6662	-0.0205
2014	0.0316	0.0427	-0.0112	-0.0398	-0.0400	0.0001
2015	0.0357	0.0382	-0.0025	-0.0280	-0.0315	0.0035
2016	0.0424	0.0457	-0.0034	-0.0412	-0.0385	-0.0026
2017	0.0414	0.0391	0.0023	-0.0268	-0.0310	0.0042
2018	0.0252	0.0288	-0.0037	-0.0261	-0.0259	-0.0003

APPENDIX XXXIX- FTSE 100 Positive vs Negative Residuals AEM for Median Net Operating Assets

MEDIAN	FTSE 100			FTSE 100		
AEM (JONES)	POSITIVE NOA	POSITIVE NOA	DIFFERENCE	NEGATIVE NOA	NEGATIVE NOA	DIFFERENCE
2004	0.0169	0.0122	0.0047	-0.0204	-0.0284	0.0080
2005	0.0258	0.0239	0.0020	-0.0267	-0.0046	-0.0222
2006	0.0312	0.0310	0.0001	-0.0225	-0.0240	0.0016
2007	0.0519	0.0505	0.0013	-0.0327	-0.0225	-0.0102
2008	0.6577	0.7544	-0.0968	-1.5456	-1.5235	-0.0221
2009	0.0180	0.0115	0.0065	-0.0216	-0.0398	0.0182
2010	0.0298	0.0328	-0.0029	-0.0346	-0.0443	0.0097
2011	0.0150	0.0150	0.0000	-0.0196	-0.0263	0.0067
2012	0.0230	0.0286	-0.0055	-0.0192	-0.0201	0.0009
2013	0.1785	0.2182	-0.0397	-0.1327	-0.0868	-0.0459
2014	0.0190	0.0243	-0.0053	-0.0138	-0.0135	-0.0003
2015	0.0276	0.0282	-0.0006	-0.0187	-0.0198	0.0011
2016	0.0259	0.0263	-0.0004	-0.0501	-0.0304	-0.0197
2017	0.0340	0.0326	0.0014	-0.0224	-0.0234	0.0009
2018	0.0186	0.0249	-0.0063	-0.0167	-0.0160	-0.0007

APPENDIX XL- FTSE 250 Positive vs Negative Residuals AEM for Average Net Operating Assets

AVERAGE	FTSE 250			FTSE 250		
AEM (JONES)	POSITIVE NOA	POSITIVE NOA	DIFFERENCE	NEGATIVE NOA	NEGATIVE NOA	DIFFERENCE
2004	0.1114	0.1113	0.0000	-0.0626	-0.0626	0.0000
2005	0.0875	0.0808	0.0068	-0.0619	-0.0648	0.0029
2006	0.0916	0.0963	-0.0047	-0.0667	-0.0693	0.0026
2007	0.0802	0.0883	-0.0081	-0.0651	-0.0626	-0.0024
2008	0.0772	0.0763	0.0009	-0.0679	-0.0678	-0.0001
2009	0.0495	0.0474	0.0021	-0.0509	-0.0473	-0.0036
2010	0.0361	0.0363	-0.0002	-0.0475	-0.0457	-0.0018
2011	0.0605	0.0621	-0.0016	-0.0490	-0.0481	-0.0009
2012	0.0457	0.0448	0.0010	-0.0430	-0.0447	0.0017
2013	0.0695	0.0707	-0.0012	-0.0466	-0.0658	0.0192
2014	0.0529	0.0604	-0.0075	-0.0518	-0.0174	-0.0344
2015	0.0597	0.0593	0.0004	-0.0501	-0.0497	-0.0004
2016	0.0538	0.1104	-0.0566	-0.0447	-0.1738	0.1291
2017	0.0460	0.0486	-0.0027	-0.0390	-0.0383	-0.0007
2018	0.0520	0.0547	-0.0027	-0.0518	-0.0550	0.0032

APPENDIX XLI- FTSE 250 Positive vs Negative Residuals AEM for Median Net Operating Assets

MEDIAN	FTSE 250			FTSE 250		
AEM (JONES)	POSITIVE NOA	POSITIVE NOA	DIFFERENCE	NEGATIVE NOA	NEGATIVE NOA	DIFFERENCE
2004	0.0548	0.0556	-0.0008	-0.0514	-0.0523	0.0009
2005	0.0547	0.0466	0.0081	-0.0404	-0.0431	0.0027
2006	0.0461	0.0514	-0.0053	-0.0516	-0.0558	0.0042
2007	0.0419	0.0470	-0.0051	-0.0438	-0.0365	-0.0073
2008	0.0394	0.0398	-0.0004	-0.0554	-0.0545	-0.0009
2009	0.0380	0.0370	0.0017	-0.0421	-0.0373	-0.0048
2010	0.0251	0.0363	-0.0150	-0.0333	-0.0311	-0.0022
2011	0.0418	0.0401	0.0061	-0.0407	-0.0407	0.0000
2012	0.0350	0.0357	-0.0002	-0.0348	-0.0332	-0.0016
2013	0.0350	0.0352	0.0030	-0.0362	-0.0533	0.0171
2014	0.0331	0.0320	0.0006	-0.0422	-0.0155	-0.0267
2015	0.0326	0.0325	-0.0635	-0.0394	-0.0364	-0.0030
2016	0.0394	0.0962	0.0142	-0.0351	-0.0651	0.0299
2017	0.0300	0.0252	0.0018	-0.0280	-0.0313	0.0033
2018	0.0282	0.0282	0.0282	-0.0400	-0.0436	0.0037

APPENDIX XLII- FTSE Small Cap Positive vs Negative Residuals AEM for Average Net Operating Assets

AVERAGE	FTSE SMALL CAP			FTSE SMALL CAP		
AEM (JONES)	POSITIVE NOA	POSITIVE NOA	DIFFERENCE	NEGATIVE NOA	NEGATIVE NOA	DIFFERENCE
2004	0.0944	0.0889	0.0054	-0.1277	-0.1346	0.0068
2005	0.0866	0.0834	0.0033	-0.1031	-0.1051	0.0021
2006	0.1133	0.1087	0.0045	-0.0794	-0.0802	0.0008
2007	0.0905	0.0881	0.0024	-0.0570	-0.0569	-0.0001
2008	0.0722	0.0723	-0.0001	-0.0655	-0.0624	-0.0032
2009	0.0689	0.0646	0.0043	-0.0775	-0.0820	0.0044
2010	0.0425	0.0429	-0.0004	-0.0512	-0.0480	-0.0032
2011	0.0600	0.0596	0.0005	-0.0514	-0.0509	-0.0005
2012	0.0479	0.0525	-0.0046	-0.0664	-0.0687	0.0023
2013	0.0664	0.0747	-0.0083	-0.0574	-0.0543	-0.0031
2014	0.0503	0.0815	-0.0312	-0.0403	-0.0703	0.0301
2015	0.4851	0.1018	0.3834	-0.1145	-0.1111	-0.0035
2016	0.0644	0.0659	-0.0014	-0.0808	-0.0765	-0.0043
2017	0.0649	0.0651	-0.0002	-0.0552	-0.0540	-0.0012
2018	0.0612	0.0607	0.0005	-0.0629	-0.0661	0.0031

APPENDIX XLIII- FTSE Small Cap Positive vs Negative Residuals AEM for Median Net Operating Assets

MEDIAN	FTSE SMALL CAP			FTSE SMALL CAP		
AEM (JONES)	POSITIVE NOA	POSITIVE NOA	DIFFERENCE	NEGATIVE NOA	NEGATIVE NOA	DIFFERENCE
2004	0.0563	0.0575	-0.0012	-0.0420	-0.0468	0.0047
2005	0.0542	0.0481	0.0061	-0.0618	-0.0686	0.0068
2006	0.3441	0.0570	0.2871	-0.0244	-0.0534	0.0290
2007	0.0624	0.0558	0.0067	-0.0376	-0.0370	-0.0006
2008	0.0499	0.0491	0.0008	-0.0274	-0.0453	0.0179
2009	0.0602	0.0339	0.0262	-0.0816	-0.0527	-0.0288
2010	0.1199	0.0268	0.0931	-0.0665	-0.0346	-0.0318
2011	0.0335	0.0314	0.0022	-0.0431	-0.0371	-0.0060
2012	0.0343	0.0365	-0.0022	-0.0295	-0.0320	0.0025
2013	0.0264	0.0260	0.0004	-0.0412	-0.0395	-0.0018
2014	0.0334	0.0334	0.0000	-0.0371	-0.0688	0.0316
2015	0.0660	0.0629	0.0030	-0.1146	-0.1160	0.0013
2016	0.0552	0.0582	-0.0030	-0.0558	-0.0516	-0.0042
2017	0.0326	0.0318	0.0008	-0.0429	-0.0408	-0.0021
2018	0.0542	0.0554	-0.0012	-0.0376	-0.0402	0.0026

APPENDIX XLIV-Positive vs Negative Residuals Average REM for Risk of Bankruptcy Abnormal Production Costs

FTSE 100	Negative	Positive	Difference	FTSE 250	Negative	Positive	Difference	FTSE Small Cap	Negative	Positive	Difference
2004	2.08	1.88	0.19	**2004**	5.07	2.36	2.72	**2004**	45.18	3.09	42.08
2005	1.98	1.89	0.10	**2005**	2.47	2.16	0.31	**2005**	6.52	3.86	2.66
2006	2.47	1.93	0.54	**2006**	2.98	2.19	0.79	**2006**	10.86	5.16	5.70
2007	1.83	1.78	0.06	**2007**	2.96	2.29	0.67	**2007**	6.25	5.98	0.27
2008	1.67	1.57	0.09	**2008**	2.64	2.36	0.28	**2008**	5.28	3.23	2.05
2009	2.49	1.60	0.89	**2009**	2.10	1.88	0.22	**2009**	4.67	2.65	2.03
2010	1.87	1.70	0.16	**2010**	2.41	1.99	0.42	**2010**	3.63	2.76	0.88
2011	2.02	1.72	0.30	**2011**	3.18	2.00	1.18	**2011**	4.99	2.85	2.14
2012	2.05	1.68	0.36	**2012**	2.61	2.28	0.33	**2012**	10.36	2.11	8.25
2013	2.06	1.71	0.63	**2013**	2.49	1.90	0.59	**2013**	4.05	3.12	0.93
2014	1.85	1.85	0.18	**2014**	2.56	1.76	0.80	**2014**	3.13	2.23	0.91
2015	1.84	1.39	0.39	**2015**	2.65	2.03	0.62	**2015**	23.44	2.14	21.30
2016	1.60	1.37	0.28	**2016**	2.18	1.87	0.32	**2016**	3.07	4.45	(1.38)
2017	1.65	1.39	0.39	**2017**	2.36	1.81	0.55	**2017**	2.63	2.05	0.59
2018	1.73	1.49	0.25	**2018**	3.27	1.70	1.58	**2018**	6.51	2.37	4.14

APPENDIX XLV-Positive vs Negative Residuals Average REM for Risk of Bankruptcy Abnormal Cash Flows

FTSE 100	Negative	Positive	Difference	FTSE 250	Negative	Positive	Difference	FTSE Small Cap	Negative	Positive	Difference
2004	1.90	1.93	(0.03)	**2004**	2.78	6.11	(3.33)	**2004**	2.27	2.50	(0.23)
2005	1.81	1.88	(0.07)	**2005**	2.21	2.39	(0.18)	**2005**	1.83	2.66	(0.84)
2006	1.89	2.02	(0.13)	**2006**	1.91	3.15	(1.24)	**2006**	1.50	2.87	(1.37)
2007	1.81	1.88	(0.08)	**2007**	2.27	2.76	(0.50)	**2007**	4.12	8.40	(4.28)
2008	1.65	1.86	(0.21)	**2008**	2.30	2.54	(0.24)	**2008**	4.37	1.89	2.47
2009	1.71	1.82	(0.10)	**2009**	1.95	2.12	(0.17)	**2009**	1.92	1.73	0.19
2010	1.72	1.84	(0.12)	**2010**	2.19	2.50	(0.31)	**2010**	1.82	2.02	(0.20)
2011	2.82	-	2.82	**2011**	2.46	3.48	(1.02)	**2011**	2.19	3.22	(1.02)
2012	1.69	1.90	(0.21)	**2012**	2.37	2.98	(0.61)	**2012**	1.60	1.39	0.21
2013	1.69	1.87	(0.19)	**2013**	2.87	2.05	0.82	**2013**	1.62	2.17	(0.55)
2014	1.71	1.79	(0.07)	**2014**	2.16	3.36	(1.20)	**2014**	3.26	2.08	1.18
2015	1.76	1.67	0.09	**2015**	2.35	2.65	(0.30)	**2015**	2.09	8.33	(6.23)
2016	1.51	1.58	(0.07)	**2016**	2.23	1.73	0.50	**2016**	6.85	1.65	5.20
2017	2.15	1.57	0.81	**2017**	2.12	1.86	0.26	**2017**	2.31	1.53	0.78
2018	1.46	1.80	0.03	**2018**	1.80	2.85	(1.05)	**2018**	1.64	1.46	0.18

APPENDIX XLVI-Positive vs Negative Residuals Average REM for Risk of Bankruptcy Abnormal Discretionary Expenses

FTSE 100	Negative	Positive	Difference	FTSE 250	Negative	Positive	Difference	FTSE Small Cap	Negative	Positive	Difference
2004	2.10	1.90	0.19	**2004**	3.05	2.24	0.81	**2004**	5.51	7.27	(1.77)
2005	1.83	2.32	(0.49)	**2005**	2.56	3.49	(0.93)	**2005**	6.93	8.25	(1.33)
2006	2.05	2.37	(0.32)	**2006**	2.38	4.72	(2.34)	**2006**	4.85	4.89	(0.04)
2007	2.02	2.21	(0.18)	**2007**	2.41	3.44	(1.03)	**2007**	4.77	6.15	(1.37)
2008	1.86	1.87	(0.00)	**2008**	1.88	3.30	(1.42)	**2008**	3.37	6.14	(2.77)
2009	1.89	1.98	(0.09)	**2009**	2.16	4.19	(2.03)	**2009**	2.67	5.69	(3.02)
2010	1.78	1.98	(0.20)	**2010**	2.61	4.11	(1.50)	**2010**	3.36	4.44	(1.08)
2011	2.03	2.08	(0.05)	**2011**	2.34	5.80	(3.46)	**2011**	3.09	5.81	(2.72)
2012	1.76	1.88	(0.12)	**2012**	2.63	3.24	(0.61)	**2012**	3.62	5.29	(1.67)
2013	1.69	1.76	(0.07)	**2013**	2.18	6.37	(4.19)	**2013**	2.21	4.20	(1.98)
2014	1.53	1.60	(0.07)	**2014**	1.97	2.22	(0.25)	**2014**	3.69	3.69	0.00
2015	1.47	1.65	(0.17)	**2015**	2.58	7.44	(4.86)	**2015**	2.29	4.31	(2.02)
2016	1.23	1.33	(0.10)	**2016**	0.84	0.74	0.10	**2016**	4.13	1.81	2.32
2017	1.77	1.17	0.60	**2017**	2.99	2.16	0.83	**2017**	4.00	2.36	1.64
2018	1.48	1.81	(0.32)	**2018**	2.86	2.10	0.76	**2018**	2.98	3.65	(0.67)

APPENDIX XLVII-Positive vs Negative Residuals Median REM for Risk of Bankruptcy Abnormal Production Costs

FTSE 100	Negative	Positive	Difference	FTSE 250	Negative	Positive	Difference	FTSE Small Cap	Negative	Positive	Difference
2004	2.25	1.83	0.42	**2004**	2.18	2.00	0.19	**2004**	3.64	2.54	1.09
2005	1.84	1.61	0.23	**2005**	2.13	1.88	0.25	**2005**	3.63	2.10	1.53
2006	2.08	2.04	0.05	**2006**	2.27	2.10	0.17	**2006**	4.81	2.27	2.55
2007	1.70	1.25	0.45	**2007**	2.24	2.27	(0.03)	**2007**	2.48	2.30	0.17
2008	1.66	1.38	0.29	**2008**	1.92	1.83	0.09	**2008**	3.08	1.93	1.15
2009	1.86	1.68	0.18	**2009**	1.76	1.72	0.04	**2009**	2.75	1.79	0.96
2010	2.01	1.73	0.28	**2010**	2.04	1.82	0.23	**2010**	2.65	1.95	0.70
2011	1.93	1.43	0.50	**2011**	2.10	1.90	0.21	**2011**	2.71	2.04	0.67
2012	1.82	1.67	0.15	**2012**	2.05	2.02	0.03	**2012**	2.26	2.05	0.21
2013	1.91	1.67	0.24	**2013**	2.01	1.73	0.29	**2013**	2.50	2.13	0.37
2014	1.65	1.44	0.20	**2014**	1.90	1.62	0.28	**2014**	2.36	2.01	0.35
2015	1.54	1.31	0.23	**2015**	1.76	1.90	(0.14)	**2015**	2.45	2.00	0.45
2016	1.45	1.26	0.19	**2016**	1.94	1.53	0.41	**2016**	2.53	2.13	0.41
2017	1.51	1.49	0.02	**2017**	2.02	1.64	0.38	**2017**	2.36	1.88	0.47
2018	1.67	1.25	0.42	**2018**	1.91	1.49	0.42	**2018**	2.55	2.01	0.54

APPENDIX XLVIII-Positive vs Negative Residuals Median REM for Risk of Bankruptcy Abnormal Cash Flows

FTSE 100	Negative	Positive	Difference	FTSE 250	Negative	Positive	Difference	FTSE Small Cap	Negative	Positive	Difference
2004	1.87	1.47	0.41	**2004**	2.36	2.17	0.19	**2004**	2.23	1.72	0.51
2005	1.60	1.81	(0.22)	**2005**	2.12	2.05	0.06	**2005**	1.88	1.88	0.00
2006	1.77	2.06	(0.29)	**2006**	1.65	2.14	(0.48)	**2006**	1.50	2.13	(0.63)
2007	1.97	1.69	0.27	**2007**	2.30	1.80	0.50	**2007**	3.41	3.87	(0.46)
2008	1.48	1.69	(0.22)	**2008**	2.01	2.04	(0.02)	**2008**	3.02	2.13	0.89
2009	1.50	1.73	(0.23)	**2009**	1.75	1.72	0.03	**2009**	1.69	1.74	(0.04)
2010	1.73	1.81	(0.08)	**2010**	2.01	2.07	(0.06)	**2010**	1.47	1.60	(0.13)
2011	1.78	-	1.78	**2011**	2.07	2.07	0.01	**2011**	2.34	2.00	0.34
2012	1.44	1.82	(0.38)	**2012**	2.29	1.91	0.39	**2012**	1.17	1.32	(0.15)
2013	1.35	1.67	(0.32)	**2013**	2.26	1.66	0.59	**2013**	1.70	2.21	(0.51)
2014	1.32	1.71	(0.39)	**2014**	2.01	1.73	0.28	**2014**	3.22	2.10	1.12
2015	1.37	1.57	(0.19)	**2015**	2.13	1.65	0.48	**2015**	2.27	1.62	0.65
2016	1.30	1.34	(0.04)	**2016**	1.94	1.52	0.42	**2016**	1.34	1.37	(0.03)
2017	1.64	1.43	0.21	**2017**	1.86	1.51	0.35	**2017**	2.90	1.49	1.41
2018	1.23	1.71	(0.48)	**2018**	1.70	2.12	(0.42)	**2018**	1.64	1.36	0.28

APPENDIX XLIX-Positive vs Negative Residuals Median REM for Risk of Bankruptcy Abnormal Discretionary Expenses

FTSE 100	Negative	Positive	Difference	FTSE 250	Negative	Positive	Difference	FTSE Small Cap	Negative	Positive	Difference
2004	2.18	1.80	0.39	**2004**	2.97	2.12	0.84	**2004**	3.25	3.51	(0.26)
2005	1.65	2.32	(0.67)	**2005**	2.12	2.36	(0.24)	**2005**	3.33	6.37	(3.04)
2006	1.89	2.58	(0.69)	**2006**	2.58	3.14	(0.55)	**2006**	2.65	3.72	(1.07)
2007	2.47	2.09	0.38	**2007**	2.59	2.58	0.01	**2007**	3.94	5.06	(1.12)
2008	1.50	1.81	(0.31)	**2008**	2.05	2.35	(0.30)	**2008**	2.45	3.21	(0.76)
2009	1.80	2.02	(0.22)	**2009**	2.24	1.90	0.34	**2009**	2.34	2.71	(0.37)
2010	1.62	2.04	(0.42)	**2010**	2.58	2.34	0.24	**2010**	2.65	2.77	(0.11)
2011	1.98	2.08	(0.10)	**2011**	2.55	2.13	0.42	**2011**	2.40	3.37	(0.97)
2012	1.78	1.78	(0.00)	**2012**	2.52	2.11	0.41	**2012**	3.45	2.83	0.62
2013	1.55	1.51	0.03	**2013**	2.23	2.40	(0.17)	**2013**	1.90	2.69	(0.80)
2014	1.39	1.26	0.13	**2014**	2.02	2.30	(0.29)	**2014**	2.82	2.68	0.13
2015	1.34	1.45	(0.11)	**2015**	2.04	2.01	0.03	**2015**	2.24	3.13	(0.90)
2016	1.29	1.15	0.13	**2016**	0.69	0.75	(0.06)	**2016**	2.54	1.74	0.80
2017	1.70	1.03	0.66	**2017**	2.15	2.09	0.07	**2017**	2.14	3.65	(1.51)
2018	1.68	1.20	0.48	**2018**	2.39	2.14	0.24	**2018**	2.43	2.96	(0.53)

APPENDIX L- Positive vs Negative Residuals REM Abnormal Production Costs for Average Tax Rates

REM ABN PROD	POSITIVE	NEGATIVE		POSITIVE	NEGATIVE		POSITIVE	NEGATIVE	
AVERAGE	FTSE 100	FTSE 100	DIFFERENCE	FTSE 250	FTSE 250	DIFFERENCE	FTSE SMALL CAP	FTSE SMALL CAP	DIFFERENCE
2004	**21%**	**27%**	-6%	**27%**	**20%**	8%	14%	**27%**	-14%
2005	**24%**	**30%**	-6%	**27%**	**31%**	-4%	**23%**	**27%**	-5%
2006	**0%**	**32%**	-32%	**27%**	**29%**	-2%	**19%**	**35%**	-16%
2007	**16%**	**26%**	-10%	**15%**	**34%**	-19%	**20%**	**35%**	-15%
2008	**26%**	**45%**	-19%	**24%**	**26%**	-2%	**20%**	**38%**	-17%
2009	**51%**	**31%**	20%	**41%**	**18%**	23%	**27%**	**13%**	14%
2010	**23%**	**40%**	-17%	**15%**	**29%**	-15%	**25%**	**19%**	6%
2011	**18%**	**22%**	-4%	**11%**	**29%**	-18%	**19%**	**21%**	-2%
2012	**17%**	**25%**	-8%	**20%**	**18%**	2%	**16%**	**23%**	-7%
2013	**15%**	**28%**	-12%	**26%**	**52%**	-26%	**17%**	**17%**	0%
2014	**14%**	**23%**	-9%	**14%**	**29%**	-16%	**11%**	**24%**	-13%
2015	**19%**	**23%**	-4%	**21%**	**32%**	-10%	**10%**	**25%**	-15%
2016	**13%**	**26%**	-13%	**18%**	**26%**	-9%	**19%**	**11%**	8%
2017	**11%**	**23%**	-13%	**11%**	**16%**	-5%	**11%**	**18%**	-6%
2018	**18%**	**20%**	-2%	**23%**	**24%**	-1%	**14%**	**25%**	-11%

APPENDIX LI- Positive vs Negative Residuals REM Abnormal Production Costs for Median Tax Rates

REM ABN PROD	POSITIVE	NEGATIVE		POSITIVE	NEGATIVE		POSITIVE	NEGATIVE	
MEDIAN	FTSE 100	FTSE 100	DIFFERENCE	FTSE 250	FTSE 250	DIFFERENCE	FTSE SMALL CAP	FTSE SMALL CAP	DIFFERENCE
2004	**29%**	**28%**	2%	**30%**	**31%**	-1%	**26%**	**29%**	-2%
2005	**29%**	**29%**	0%	**28%**	**31%**	-3%	**27%**	**30%**	-3%
2006	**0%**	**29%**	-29%	**26%**	**30%**	-4%	**28%**	28%	0%
2007	**28%**	**29%**	-1%	**26%**	**30%**	-4%	**26%**	**27%**	-1%
2008	**28%**	**29%**	-1%	**26%**	**29%**	-3%	**27%**	**28%**	-1%
2009	**28%**	**29%**	-1%	**27%**	**28%**	-1%	**26%**	**27%**	-1%
2010	**26%**	**27%**	0%	**22%**	**28%**	-7%	**27%**	**25%**	1%
2011	**21%**	**26%**	-5%	**19%**	**26%**	-7%	**22%**	**25%**	-3%
2012	**22%**	**25%**	-4%	**19%**	**24%**	-5%	**21%**	**25%**	-4%
2013	**22%**	**24%**	-2%	**17%**	**24%**	-7%	**22%**	**22%**	0%
2014	**20%**	**23%**	-3%	**17%**	**22%**	-5%	**17%**	**23%**	-6%
2015	**22%**	**21%**	0%	**16%**	**21%**	-6%	**13%**	**21%**	-8%
2016	**19%**	**22%**	-4%	**18%**	**20%**	-2%	**18%**	**17%**	0%
2017	**17%**	**24%**	-7%	**14%**	**19%**	-5%	**17%**	**20%**	-3%
2018	**19%**	**22%**	-3%	**15%**	**19%**	-5%	**18%**	**21%**	-3%

APPENDIX LII-Positive vs Negative Residuals REM Abnormal Cash Flows for Average Tax Rates

REM ABN CASH FLOW	POSITIVE	NEGATIVE		POSITIVE	NEGATIVE		POSITIVE	NEGATIVE	
AVERAGE	FTSE 100	FTSE 100	DIFFERENCE	FTSE 250	FTSE 250	DIFFERENCE	FTSE SMALL CAP	FTSE SMALL CAP	DIFFERENCE
2004	**19%**	**28%**	-8%	**20%**	**25%**	-5%	**25%**	**19%**	6%
2005	**25%**	**31%**	-6%	**30%**	**23%**	6%	**22%**	**21%**	1%
2006	**0%**	**30%**	-30%	**25%**	**27%**	-2%	**49%**	**12%**	37%
2007	**26%**	**19%**	6%	**32%**	**13%**	19%	**21%**	**34%**	-13%
2008	**52%**	**31%**	21%	**27%**	**20%**	7%	**19%**	**18%**	1%
2009	**43%**	**38%**	4%	**30%**	**25%**	5%	**11%**	**17%**	-5%
2010	**38%**	**23%**	15%	**20%**	**16%**	4%	**33%**	**12%**	21%
2011	**23%**	**14%**	9%	**23%**	**11%**	12%	**31%**	**39%**	-7%
2012	**26%**	**17%**	9%	**23%**	**18%**	5%	**20%**	**20%**	0%
2013	**27%**	**22%**	5%	**50%**	**26%**	24%	**20%**	**31%**	-10%
2014	**20%**	**26%**	-6%	**22%**	**14%**	8%	**16%**	**14%**	2%
2015	**20%**	**11%**	8%	**34%**	**10%**	24%	**15%**	**14%**	2%
2016	**21%**	**22%**	-1%	**21%**	**17%**	5%	**10%**	**17%**	-7%
2017	**19%**	**14%**	5%	**15%**	**9%**	6%	**16%**	**28%**	-11%
2018	**21%**	**27%**	-6%	**29%**	**9%**	20%	**17%**	**17%**	0%

APPENDIX LIII- Positive vs Negative Residuals REM Abnormal Cash Flows for Median Tax Rates

REM ABN CASH FLOW	POSITIVE	NEGATIVE		POSITIVE	NEGATIVE		POSITIVE	NEGATIVE	
MEDIAN	FTSE 100	FTSE 100	DIFFERENCE	FTSE 250	FTSE 250	DIFFERENCE	FTSE SMALL CAP	FTSE SMALL CAP	DIFFERENCE
2004	**27%**	**31%**	-4%	**31%**	**28%**	3%	**29%**	**20%**	9%
2005	**29%**	**32%**	-3%	**31%**	**28%**	3%	**28%**	**24%**	5%
2006	**0%**	**29%**	-29%	**28%**	**27%**	2%	**25%**	**28%**	-2%
2007	**29%**	**27%**	2%	**28%**	**24%**	4%	**27%**	**25%**	3%
2008	**28%**	**29%**	-1%	**28%**	**22%**	6%	**26%**	**21%**	5%
2009	**28%**	**30%**	-2%	**27%**	**20%**	7%	**28%**	**16%**	11%
2010	**27%**	**28%**	-1%	**26%**	**20%**	6%	**27%**	**20%**	7%
2011	**24%**	**23%**	1%	**23%**	**19%**	4%	**27%**	**16%**	11%
2012	**25%**	**22%**	3%	**24%**	**19%**	5%	**26%**	**18%**	7%
2013	**24%**	**23%**	2%	**21%**	**15%**	7%	**23%**	**17%**	6%
2014	**21%**	**22%**	-1%	**20%**	**17%**	2%	**20%**	**10%**	10%
2015	**21%**	**21%**	0%	**20%**	**16%**	3%	**21%**	**4%**	17%
2016	**21%**	**21%**	0%	**18%**	**19%**	0%	**17%**	**15%**	3%
2017	**19%**	**21%**	-2%	**18%**	**11%**	8%	**20%**	**13%**	7%
2018	**20%**	**22%**	-1%	**19%**	**11%**	8%	**19%**	**18%**	1%

APPENDIX LIV- Positive vs Negative Residuals AEM Abnormal Disretonary Expenses for Average Tax Rates

REM ABN DISCRETIONARY EXPENSES	POSITIVE	NEGATIVE		POSITIVE	NEGATIVE		POSITIVE	NEGATIVE	
AVERAGE	FTSE 100	FTSE 100	DIFFERENCE	FTSE 250	FTSE 250	DIFFERENCE	FTSE SMALL CAP	FTSE SMALL CAP	DIFFERENCE
2004	**28%**	**22%**	6%	**22%**	**27%**	-5%	**22%**	**24%**	-2%
2005	**33%**	**26%**	8%	**29%**	**26%**	4%	**16%**	**25%**	-9%
2006	**28%**	**32%**	-4%	**29%**	**26%**	3%	**19%**	**24%**	-5%
2007	**27%**	**18%**	9%	**25%**	**21%**	4%	**30%**	**28%**	2%
2008	**44%**	**25%**	19%	**32%**	**20%**	12%	**36%**	**15%**	21%
2009	**31%**	**44%**	-13%	**0%**	**27%**	-27%	**17%**	**20%**	-3%
2010	**29%**	**28%**	0%	**29%**	**16%**	13%	**18%**	**19%**	-1%
2011	**24%**	**18%**	6%	**23%**	**16%**	7%	**23%**	**19%**	5%
2012	**19%**	**25%**	-6%	**19%**	**14%**	4%	**20%**	**21%**	-1%
2013	**20%**	**26%**	-6%	**21%**	**32%**	-11%	**22%**	**13%**	9%
2014	**25%**	**24%**	2%	**22%**	**18%**	4%	**25%**	**11%**	14%
2015	**23%**	**16%**	7%	**20%**	**25%**	-5%	**13%**	**11%**	2%
2016	**26%**	**19%**	7%	**16%**	**19%**	-3%	**14%**	**13%**	1%
2017	**22%**	**22%**	0%	**16%**	**12%**	5%	**19%**	**12%**	8%
2018	**15%**	**29%**	-14%	**15%**	**22%**	-7%	**20%**	**11%**	10%

APPENDIX LV- Positive vs Negative Residuals AEM Abnormal Disretonary Expenses for Median Tax Rates

REM ABN DISCRETIONARY EXPENSES	POSITIVE	NEGATIVE		POSITIVE	NEGATIVE		POSITIVE	NEGATIVE	
MEDIAN	FTSE 100	FTSE 100	DIFFERENCE	FTSE 250	FTSE 250	DIFFERENCE	FTSE SMALL CAP	FTSE SMALL CAP	DIFFERENCE
2004	**30%**	**29%**	1%	**31%**	**30%**	1%	**15%**	**27%**	-12%
2005	**30%**	**29%**	1%	**30%**	**29%**	1%	**13%**	**28%**	-15%
2006	**28%**	**29%**	-1%	**30%**	**27%**	3%	**25%**	**27%**	-2%
2007	**29%**	**28%**	1%	**29%**	**26%**	3%	**18%**	**27%**	-9%
2008	**29%**	**27%**	2%	**29%**	**25%**	3%	**21%**	**28%**	-7%
2009	**28%**	**30%**	-2%	**0%**	**26%**	-26%	**22%**	**27%**	-5%
2010	**26%**	**27%**	-1%	**26%**	**22%**	4%	**23%**	**25%**	-1%
2011	**26%**	**23%**	3%	**25%**	**20%**	5%	**24%**	**20%**	4%
2012	**24%**	**23%**	1%	**25%**	**20%**	5%	**25%**	**21%**	4%
2013	**23%**	**24%**	-1%	**21%**	**17%**	3%	**24%**	**18%**	6%
2014	**20%**	**23%**	-3%	**20%**	**18%**	2%	**21%**	**15%**	6%
2015	**21%**	**21%**	0%	**21%**	**18%**	3%	**19%**	**11%**	7%
2016	**22%**	**20%**	2%	**18%**	**16%**	2%	**21%**	**9%**	12%
2017	**19%**	**23%**	-3%	**19%**	**15%**	3%	**21%**	**16%**	5%
2018	**19%**	**23%**	-4%	**15%**	**16%**	0%	**19%**	**16%**	4%

Appendix B: inferential Statistics

APPENDIX LVI: AEM LEAST SQUARES REGRESSIONS for Negative Residuals

AEM JONES Negative Residuals						
		B	t	P-value	Model	ANOVA
FTSE100	(Constant)	-0.037	-0.933	0.351	R=0.859, R2=0.738, Adj R2=0.729	F (15, 489) =91.600, p=0.000
	A. PROD	-0.053	-0.900	0.369		
	A. CASH FLOWS	0.503	2.490	0.013		
	A. D. EXPEN	0.023	0.224	0.823		
	Time	-0.004	-1.211	0.226		
	F. Crisis	-0.668	-16.845	0.000		
	change in GDP	0.028	4.496	0.000		
	return in equity	0.014	1.084	0.279		
	N.O. Assets	0.000	1.861	0.063		
	operating cycle	0.000	-0.839	0.402		
	Debt Ratio	0.000	0.920	0.358		
	Debt to EBITDA	0.000	-0.072	0.942		
	Debt to Equity	-0.001	-0.393	0.694		
	Quick ratio	0.076	1.967	0.050		
	T.I. Earned	0.000	-30.757	0.000		
	W. Capital	-0.049	-1.564	0.119		
FTSE250	(Constant)	-0.034	-1.904	0.057	R=0.515, R2=0.265, Adj R2=0.253	F (15, 935) =22.473, p=0.000
	A. PROD	0.010	0.431	0.666		
	A. CASH FLOWS	-0.064	-0.849	0.396		
	A. D. EXPEN	0.028	0.516	0.606		
	Time	0.001	0.342	0.733		
	F. Crisis	-0.009	-0.418	0.676		
	Change in GDP	0.003	0.888	0.375		
	return in equity	-0.001	-0.334	0.739		
	N.O. Assets	0.000	-17.981	0.000		
	operating cycle	0.000	1.958	0.051		
	Debt Ratio	0.000	0.596	0.552		
	Debt to EBITDA	0.000	0.117	0.907		
	Debt to Equity	0.000	0.344	0.731		
	Quick ratio	0.010	0.581	0.561		
	T.I. Earned	0.000	-0.085	0.932		
	W. Capital	-0.018	-1.301	0.193		
SMALL CAPS	(Constant)	-0.122	-8.178	0.000	R=0.250, R2=0.063, Adj R2=0.040	F (15, 617) =2.753, p=0.000
	A. PROD	0.005	0.209	0.834		
	A. CASH FLOWS	0.100	1.676	0.094		
	A. D. EXPEN	-0.103	-4.240	0.000		
	Time	0.003	2.508	0.012		
	F. Crisis	0.032	2.089	0.037		
	change in GDP	0.004	1.679	0.094		
	return in equity	0.003	1.406	0.160		
	N.O. Assets	0.000	-0.594	0.552		
	operating cycle	0.000	0.133	0.894		
	Debt Ratio	0.000	-0.013	0.990		
	Debt to EBITDA	0.000	0.114	0.909		
	Debt to Equity	-0.001	-1.126	0.261		
	Quick ratio	-0.028	-1.452	0.147		
	T.I. Earned	0.000	-0.791	0.429		
	W. Capital	0.037	2.215	0.027		

APPENDIX LVII- AEM LEAST SQUARES REGRESSIONS for Positive Residuals

AEM JONES Positive Residuals						
		B	t	P-value	Model	ANOVA
FTSE100	(Constant)	0.196	0.346	0.730	R=0.426, R2=0.181, Adj R2=0.145	F (15, 338) =4.925, p=0.000
	A. PROD	-2.348	-4.455	0.000		
	A. CASH FLOWS	15.225	6.599	0.000		
	A. D. EXPEN	-3.370	-2.417	0.016		
	Time	-0.007	-0.148	0.882		
	F. Crisis	3.068	3.832	0.000		
	change in GDP	-0.090	-0.854	0.394		
	return in equity	-0.517	-1.463	0.144		
	N.O. Assets	0.000	-0.812	0.417		
	operating cycle	0.000	-0.052	0.959		
	Debt Ratio	0.000	0.395	0.693		
	Debt to EBITDA	0.077	1.024	0.306		
	Debt to Equity	0.050	0.859	0.391		
	Quick ratio	-0.260	-0.638	0.524		
	T.I. Earned	-0.001	-0.563	0.574		
	W. Capital	0.069	0.214	0.830		
FTSE250	(Constant)	0.056	7.025	0.000	R=0.312, R2=0.097, Adj R2=0.078	F (15, 721) =5.166, p=0.000
	A. PROD	0.016	1.844	0.066		
	A. CASH FLOWS	-0.064	-2.273	0.023		
	A. D. EXPEN	-0.013	-0.685	0.493		
	Time	-0.003	-4.087	0.000		
	F. Crisis	-0.001	-0.156	0.876		
	Change in GDP	-0.001	-0.646	0.518		
	return in equity	0.003	0.862	0.389		
	N.O. Assets	0.000	-0.744	0.457		
	operating cycle	0.000	-2.254	0.025		
	Debt Ratio	0.000	2.726	0.007		
	Debt to EBITDA	0.000	1.506	0.133		
	Debt to Equity	0.000	-0.644	0.520		
	Quick ratio	-0.007	-1.519	0.129		
	T.I. Earned	0.000	-1.079	0.281		
	W. Capital	0.019	5.020	0.000		
SMALL CAPS	(Constant)	0.057	1.850	0.065	R=0.425, R2=0.181, Adj R2=0.158	F (15, 530) =7.802, p=0.000
	A. PROD	-0.107	-2.040	0.042		
	A. CASH FLOWS	-0.357	-3.187	0.002		
	A. D. EXPEN	-0.081	-1.696	0.091		
	Time	0.002	0.618	0.537		
	F. Crisis	0.010	0.282	0.778		
	change in GDP	-0.006	-1.197	0.232		
	return in equity	0.121	6.664	0.000		
	N.O. Assets	0.000	-0.029	0.977		
	operating cycle	0.000	-4.417	0.000		
	Debt Ratio	0.000	-0.218	0.827		
	Debt to EBITDA	0.002	4.985	0.000		
	Debt to Equity	-0.024	-5.365	0.000		
	Quick ratio	0.022	0.711	0.477		
	T.I. Earned	0.000	0.219	0.827		
	W. Capital	-0.016	-0.590	0.555		

APPENDIX LVIII-FTSE 100 REM Least Squares Regression for Abnormal Cash Flows

Positive Residuals

a. FTSE 100 Dependent Variable: ABNORMAL CASH FLOWS (Positive Residuals) Predictors: (Constant), Working capital, ABNORMAL PRODUCTION, time, Debt to Equity, change in GDP, Debt to EBITDA, Debt ratio, tax rate, Times interest earned, DISCRETIONARY ACCRUALS, financial crisis, ABNORMAL DISCRETIONARY EXPENSES, Quick ratio, return in equity, Risk of bankruptcy

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.608	15	.041	23.923	.000[b]
	Residual	.654	386	.002		
	Total	1.262	401			

Coefficient

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	0.017	0.008		2.248	0.025	0.002	0.032
DISCRETIONARY ACCRUALS	0.004	0.001	0.232	5.920	0.000	0.003	0.005
ABNORMAL PRODUCTION	-0.157	0.016	-0.456	-9.955	0.000	-0.188	-0.126
ABNORMAL DISCRETIONARY EXPENSES	-0.076	0.015	-0.223	-5.157	0.000	-0.105	-0.047
Time	-0.001	0.001	-0.072	-1.793	0.074	-0.002	0.000
financial crisis	0.013	0.007	0.079	1.898	0.058	0.000	0.027
change in GDP	-0.002	0.001	-0.058	-1.510	0.132	-0.003	0.000
return in equity	0.002	0.002	0.082	0.778	0.437	-0.002	0.006
Risk of bankruptcy	0.008	0.003	0.446	2.432	0.015	0.001	0.014
tax rate	0.000	0.002	0.001	0.034	0.973	-0.005	0.005
Debt ratio	0.000	0.000	-0.357	-1.968	0.050	0.000	0.000
Debt to EBITDA	-0.001	0.000	-0.045	-1.188	0.235	-0.002	0.000
Debt to Equity	0.000	0.000	-0.134	-1.289	0.198	-0.001	0.000
Quick ratio	0.034	0.006	0.432	5.563	0.000	0.022	0.046
Times interest earned	0.000	0.000	0.060	1.583	0.114	0.000	0.000
Working capital	-0.007	0.005	-0.108	-1.353	0.177	-0.018	0.003

FTSE 100 Dependent Variable: ABNORMAL CASH FLOWS (Positive Residuals)

APPENDIX LIX- FTSE 100 REM Least Squares Regression for Abnormal Discretionary Expenses Positive Residuals

a. FTSE 100 Dependent Variable: ABNORMAL DISCRETIONARY EXPENSES (Positive Residuals) Predictors: (Constant), Working capital, ABNORMAL PRODUCTION, tax rate, financial crisis, Debt to Equity, ABNORMAL CASH FLOWS, Times interest earned, change in GDP, Debt to EBITDA, time, Risk of bankruptcy, Debt ratio, DISCRETIONARY ACCRUALS, Quick ratio, return in equity

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.436	15	.229	25.866	.000[b]
	Residual	1.789	202	.009		
	Total	5.225	217			

Coefficient							
				T	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	0.068	0.031		2.162	0.032	0.006	0.130
DISCRETIONARY ACCRUALS	-0.040	0.020	-0.204	-2.028	0.044	-0.079	-0.001
ABNORMAL CASH FLOWS	1.092	0.110	0.441	9.945	0.000	0.876	1.309
ABNORMAL PRODUCTION	-0.420	0.029	-0.669	-14.581	0.000	-0.477	-0.363
Time	0.002	0.002	0.055	1.090	0.277	-0.002	0.006
financial crisis	0.034	0.026	0.073	1.312	0.191	-0.017	0.085
change in GDP	0.001	0.003	0.021	0.493	0.623	-0.004	0.007
return in equity	0.018	0.020	0.304	0.894	0.372	-0.022	0.057
Risk of bankruptcy	0.024	0.011	0.117	2.271	0.024	0.003	0.045
tax rate	-0.004	0.008	-0.020	-0.482	0.630	-0.019	0.012
Debt ratio	0.000	0.000	-0.116	-1.503	0.134	-0.001	0.000
Debt to EBITDA	-0.001	0.002	-0.024	-0.520	0.603	-0.005	0.003
Debt to Equity	-0.003	0.003	-0.326	-0.959	0.338	-0.009	0.003
Quick ratio	0.129	0.038	0.381	3.417	0.001	0.054	0.203
Times interest earned	0.000	0.000	-0.165	-1.547	0.124	0.000	0.000
Working capital	-0.097	0.031	-0.317	-3.086	0.002	-0.158	-0.035

FTSE 100 Dependent Variable: ABNORMAL DISCRETIONARY EXPENSES (Positive Residuals)

APPENDIX LX- FTSE 100 REM Least Squares Regression for Abnormal Production Costs Positive Residuals

b. FTSE 100 Dependent Variable: ABNORMAL PRODUCTION (Positive Residuals) Predictors: (Constant), Working capital, time, Debt to Equity, change in GDP, Debt to EBITDA, ABNORMAL CASH FLOWS, tax rate, Debt ratio, ABNORMAL DISCRETIONARY EXPENSES, DISCRETIONARY ACCRUALS, return in equity, Times interest earned, financial crisis, Quick ratio, Risk of bankruptcy

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.393	15	.093	20.238	.000[b]
	Residual	1.721	375	.005		
	Total	3.115	390			

Coefficient

						95.0% Confidence Interval for B	
	B	Std. Error	Beta	T	Sig.	Lower Bound	Upper Bound
(Constant)	0.094	0.011		8.306	0.000	0.072	0.116
DISCRETIONARY ACCRUALS	0.025	0.010	0.120	2.640	0.009	0.006	0.044
ABNORMAL CASH FLOWS	-0.870	0.071	-0.506	-12.339	0.000	-1.009	-0.732
ABNORMAL DISCRETIONARY EXPENSES	-0.431	0.063	-0.270	-6.878	0.000	-0.555	-0.308
Time	-0.001	0.001	-0.040	-0.953	0.341	-0.003	0.001
financial crisis	0.025	0.012	0.097	2.035	0.043	0.001	0.048
change in GDP	0.001	0.002	0.026	0.644	0.520	-0.002	0.004
return in equity	-0.006	0.008	-0.033	-0.733	0.464	-0.021	0.010
Risk of bankruptcy	0.005	0.002	0.288	2.311	0.021	0.001	0.009
tax rate	-0.001	0.004	-0.015	-0.373	0.710	-0.009	0.006
Debt ratio	0.000	0.000	-0.230	-1.894	0.059	0.000	0.000
Debt to EBITDA	0.000	0.000	-0.020	-0.499	0.618	-0.001	0.000
Debt to Equity	0.000	0.001	-0.008	-0.182	0.856	-0.002	0.002
Quick ratio	-0.036	0.009	-0.204	-4.147	0.000	-0.053	-0.019
Times interest earned	0.000	0.000	0.031	0.678	0.498	0.000	0.001
Working capital	0.017	0.006	0.138	2.761	0.006	0.005	0.029

FTSE 100 Dependent Variable: ABNORMAL PRODUCTION (Positive Residuals)

APPENDIX LXI- FTSE 250 REM Least Squares Regression for Abnormal Cash Flow Positive Residuals

. FTSE 250 Dependent Variable: ABNORMAL CASH FLOWS (Positive Residuals) Predictors: (Constant), Working capital, DISCRETIONARY ACCRUALS, Debt to Equity, Debt to EBITDA, financial crisis, tax rate, Risk of bankruptcy, ABNORMAL PRODUCTION, change in GDP, ABNORMAL DISCRETIONARY EXPENSES, time, Debt ratio, return in equity, Times interest earned, Quick ratio

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.350	15	.023	5.666	.000[b]
	Residual	2.620	636	.004		
	Total	2.970	651			

Coefficients

						95.0% Confidence Interval for B	
	B	Std. Error	Beta	T	Sig.	Lower Bound	Upper Bound
(Constant)	0.075	0.007		11.208	0.000	0.062	0.088
DISCRETIONARY ACCRUALS	-0.005	0.008	-0.021	-0.562	0.574	-0.021	0.012
ABNORMAL PRODUCTION	-0.060	0.011	-0.227	-5.558	0.000	-0.081	-0.039
ABNORMAL DISCRETIONARY EXPENSES	-0.054	0.018	-0.124	-3.099	0.002	-0.089	-0.020
Time	-0.001	0.001	-0.062	-1.484	0.138	-0.002	0.000
financial crisis	0.004	0.008	0.022	0.538	0.591	-0.012	0.020
change in GDP	0.002	0.001	0.048	1.232	0.218	-0.001	0.004
return in equity	-0.001	0.002	-0.038	-0.669	0.504	-0.005	0.003
Risk of bankruptcy	0.000	0.000	0.011	0.182	0.855	-0.001	0.001
tax rate	0.004	0.003	0.050	1.275	0.203	-0.002	0.011
Debt ratio	0.000	0.000	0.148	3.466	0.001	0.000	0.000
Debt to EBITDA	-0.001	0.001	-0.087	-2.275	0.023	-0.002	0.000
Debt to Equity	0.000	0.000	0.040	0.718	0.473	0.000	0.001
Quick ratio	0.004	0.005	0.067	0.810	0.418	-0.006	0.015
Times interest earned	0.000	0.000	0.023	0.376	0.707	0.000	0.000
Working capital	-0.003	0.005	-0.053	-0.652	0.514	-0.012	0.006

FTSE 250 Dependent Variable: ABNORMAL CASH FLOWS (Positive Residuals)

APPENDIX LXII- FTSE 250 REM Least Squares Regression for Abnormal Discretionary Expenses Positive Residuals

a. FTSE 250 Dependent Variable: ABNORMAL DISCRETIONARY EXPENSES (Positive Residuals) Predictors: (Constant), Working capital, return in equity, Risk of bankruptcy, change in GDP, tax rate, DISCRETIONARY ACCRUALS, Debt to EBITDA, ABNORMAL PRODUCTION, financial crisis, time, Times interest earned, ABNORMAL CASH FLOWS, Debt ratio, Quick ratio, Debt to Equity

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	4.435	15	.296	7.541	.000[b]
	Residual	17.253	440	.039		
	Total	21.688	455			

	Coefficient					95.0% Confidence Interval for B	
	B	Std. Error	Beta	T	P-value	Lower Bound	Upper Bound
(Constant)	0.157	0.027		5.792	0.000	0.104	0.211
DISCRETIONARY ACCRUALS	0.161	0.115	0.061	1.396	0.163	-0.066	0.387
ABNORMAL PRODUCTION	-0.254	0.032	-0.399	-7.921	0.000	-0.317	-0.191
ABNORMAL CASH FLOWS	-0.243	0.103	-0.117	-2.355	0.019	-0.447	-0.040
Time	0.008	0.003	0.148	3.112	0.002	0.003	0.013
financial crisis	0.075	0.029	0.121	2.607	0.009	0.018	0.131
change in GDP	0.006	0.004	0.064	1.438	0.151	-0.002	0.015
return in equity	0.001	0.005	0.041	0.255	0.799	-0.009	0.012
Risk of bankruptcy	-0.004	0.001	-0.191	-3.344	0.001	-0.007	-0.002
tax rate	-0.011	0.010	-0.046	-1.014	0.311	-0.031	0.010
Debt ratio	0.000	0.000	0.131	2.419	0.016	0.000	0.000
Debt to EBITDA	0.000	0.001	-0.012	-0.285	0.776	-0.001	0.001
Debt to Equity	0.000	0.001	-0.080	-0.502	0.616	-0.002	0.001
Quick ratio	0.025	0.026	0.113	0.963	0.336	-0.026	0.075
Times interest earned	0.000	0.000	0.152	3.152	0.002	0.000	0.000
Working capital	-0.026	0.023	-0.129	-1.115	0.265	-0.071	0.020

FTSE 250 Dependent Variable: ABNORMAL DISCRETIONARY EXPENSES (Positive Residuals)

APPENDIX LXIII- FTSE 250 REM Least Squares Regression for Abnormal Production costs Positive Residuals

FTSE 250 Dependent Variable: ABNORMAL PRODUCTION (Positive Residuals) Predictors: (Constant), Working capital, financial crisis, return in equity, tax rate, Times interest earned, ABNORMAL DISCRETIONARY EXPENSES, Debt ratio, Debt to EBITDA, DISCRETIONARY ACCRUALS, change in GDP, Debt to Equity, time, ABNORMAL CASH FLOWS, Risk of bankruptcy, Quick ratio

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	42.535	15	2.836	20.640	.000[b]
	Residual	124.746	908	.137		
	Total	167.280	923			

	Coefficients					95.0% Confidence Interval for B	
	B	Std. Error	Beta	T	P-value	Lower Bound	Upper Bound
(Constant)	-0.110	0.037		-2.981	0.003	-0.183	-0.038
DISCRETIONARY ACCRUALS	0.116	0.142	0.026	0.819	0.413	-0.162	0.394
ABNORMAL CASH FLOWS	-1.292	0.133	-0.317	-9.738	0.000	-1.552	-1.032
ABNORMAL DISCRETIONARY EXPENSES	-0.115	0.114	-0.030	-1.015	0.311	-0.339	0.108
Time	0.034	0.003	0.340	10.992	0.000	0.028	0.040
financial crisis	0.023	0.040	0.018	0.564	0.573	-0.056	0.102
change in gdp	0.001	0.006	0.003	0.089	0.929	-0.011	0.012
return in equity	-0.016	0.012	-0.038	-1.265	0.206	-0.040	0.009
Risk of bankruptcy	0.039	0.011	0.149	3.455	0.001	0.017	0.062
tax rate	-0.006	0.009	-0.020	-0.697	0.486	-0.024	0.011
Debt ratio	0.000	0.000	-0.087	-2.135	0.033	0.000	0.000
Debt to EBITDA	-0.001	0.000	-0.055	-1.872	0.061	-0.002	0.000
Debt to Equity	0.004	0.003	0.041	1.360	0.174	-0.002	0.009
Quick ratio	0.038	0.018	0.109	2.140	0.033	0.003	0.072
Times interest earned	0.000	0.000	0.056	1.964	0.050	0.000	0.000
Working capital	-0.032	0.015	-0.108	-2.131	0.033	-0.061	-0.003

FTSE 250 Dependent Variable: ABNORMAL PRODUCTION (Positive Residuals)

APPENDIX LXIV- FTSE 250 REM Least Squares Regression for Abnormal Cash Flows Positive Residuals

a. FTSE Small Cap Dependent Variable: ABNORMAL CASH FLOWS (Positive Residuals)
Predictors: (Constant), Working capital, Debt to Equity, time, tax rate, Risk of bankruptcy, ABNORMAL PRODUCTION, change in GDP, Times interest earned, Debt to EBITDA, DISCRETIONARY ACCRUALS, financial crisis, ABNORMAL DISCRETIONARY EXPENSES, return in equity, Debt ratio, Quick ratio

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.460	15	.031	7.931	.000[b]
	Residual	1.739	450	.004		
	Total	2.199	465			

	Coefficients					95.0% Confidence Interval for B	
	B	Std. Error	Beta	T	P-value	Lower Bound	Upper Bound
(Constant)	0.051	0.008		6.168	0.000	0.035	0.067
DISCRETIONARY ACCRUALS	-0.169	0.038	-0.193	-4.492	0.000	-0.243	-0.095
ABNORMAL PRODUCTION	-0.080	0.012	-0.317	-6.615	0.000	-0.104	-0.056
ABNORMAL DISCRETIONARY EXPENSES	0.007	0.013	0.025	0.514	0.608	-0.019	0.032
Time	-0.001	0.001	-0.039	-0.864	0.388	-0.002	0.001
financial crisis	0.005	0.010	0.024	0.526	0.599	-0.014	0.024
change in GDP	-0.002	0.001	-0.049	-1.117	0.265	-0.004	0.001
return in equity	0.008	0.006	0.153	1.337	0.182	-0.004	0.020
Risk of bankruptcy	0.000	0.000	0.213	1.834	0.067	0.000	0.000
tax rate	0.005	0.004	0.049	1.159	0.247	-0.003	0.013
Debt ratio	0.000	0.000	-0.186	-1.609	0.108	0.000	0.000
Debt to EBITDA	0.000	0.000	0.035	0.772	0.440	0.000	0.001
Debt to Equity	-0.001	0.001	-0.123	-1.083	0.279	-0.004	0.001
Quick ratio	0.028	0.010	0.341	2.786	0.006	0.008	0.048
Times interest earned	0.000	0.000	0.083	1.936	0.054	0.000	0.000
Working capital	-0.014	0.009	-0.192	-1.564	0.119	-0.031	0.004

FTSE Small Cap Dependent Variable: ABNORMAL CASH FLOWS (Positive Residuals)

APPENDIX LXV- FTSE Small Cap REM Least Squares Regression for Abnormal Discretionary Expenses Positive Residuals

a. FTSE Small Cap Dependent Variable: ABNORMAL DISCRETIONARY EXPENSES (Positive Residuals)

Predictors: (Constant), Working capital, Risk of bankruptcy, change in GDP, tax rate, Debt to EBITDA, ABNORMAL CASH FLOWS, return in equity, time, Times interest earned, financial crisis, ABNORMAL PRODUCTION, Debt ratio, DISCRETIONARY ACCRUALS, Debt to Equity, Quick ratio

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	15.356	15	1.024	42.266	.000[b]
	Residual	6.903	285	.024		
	Total	22.258	300			

Coefficient

	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
(Constant)	.155	.030		5.244	.000	.097	.213
DISCRETIONARY ACCRUALS	.096	.116	.031	.824	.411	-.133	.325
ABNORMAL PRODUCTION	-1.062	.048	-.825	-22.241	.000	-1.155	-.968
ABNORMAL CASH FLOWS	-1.080	.111	-.387	-9.754	.000	-1.298	-.862
Time	.003	.002	.039	1.063	.289	-.002	.007
financial crisis	.000	.028	.001	.015	.988	-.055	.056
change in GDP	-.002	.004	-.014	-.398	.691	-.010	.007
return in equity	-.001	.015	-.002	-.041	.967	-.031	.030
Risk of bankruptcy	.000	.000	.018	.470	.638	.000	.001
tax rate	-.002	.004	-.014	-.426	.671	-.011	.007
Debt ratio	-9.305E-07	.000	-.022	-.591	.555	.000	.000
Debt to EBITDA	-.001	.001	-.035	-1.019	.309	-.004	.001
Debt to Equity	-.005	.009	-.021	-.552	.582	-.022	.012
Quick ratio	.085	.033	.268	2.600	.010	.021	.148
Times interest earned	.000	.000	.071	1.927	.055	.000	.000
Working capital	-.045	.030	-.154	-1.515	.131	-.103	.013

FTSE Small Cap Dependent Variable: ABNORMAL DISCRETIONARY EXPENSES (Positive Residuals)

APPENDIX LXVI- FTSE Small Cap REM Least Squares Regression for Abnormal Production costs Positive Residuals

a. . FTSE Small Cap Dependent Variable: ABNORMAL PRODUCTION (Positive Residuals) Predictors: (Constant), Working capital, Times interest earned, change in GDP, tax rate, return in equity, ABNORMAL CASH FLOWS, Risk of bankruptcy, Debt to EBITDA, DISCRETIONARY ACCRUALS, time, ABNORMAL DISCRETIONARY EXPENSES, financial crisis, Debt to Equity, Quick ratio, Debt ratio

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.896	15	.326	19.656	.000[b]
	Residual	7.605	458	.017		
	Total	12.501	473			

Coefficient

	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
(Constant)	.125	.021		5.931	.000	.084	.166
DISCRETIONARY ACCRUALS	.069	.068	.038	1.009	.314	-.065	.203
ABNORMAL CASH FLOWS	-.637	.083	-.294	-7.667	.000	-.800	-.474
ABNORMAL DISCRETIONARY EXPENSES	-.566	.049	-.466	-11.610	.000	-.662	-.470
Time	.000	.002	-.007	-.166	.868	-.004	.003
financial crisi	-.020	.019	-.044	-1.077	.282	-.057	.017
change in gdp	.000	.003	.004	.097	.923	-.005	.006
return in equity	-.003	.005	-.030	-.605	.545	-.014	.007
Risk of bankruptcy	.001	.000	.397	1.669	.096	.000	.001
tax rate	-.001	.003	-.012	-.322	.748	-.008	.006
Debt ratio	-1.765E-05	.000	-.356	-1.496	.135	.000	.000
Debt to EBITDA	-.001	.001	-.081	-2.157	.032	-.002	.000
Debt to Equity	.002	.001	.072	1.455	.146	-.001	.004
Quick ratio	-.012	.019	-.041	-.640	.523	-.051	.026
Times interest earned	1.884E-05	.000	.029	.796	.426	.000	.000
Working capital	.007	.016	.029	.440	.660	-.024	.037

FTSE Small Cap Dependent Variable: ABNORMAL PRODUCTION (Positive Residuals)

APPENDIX LXVII- FTSE 100 REM Least Squares Regression for Abnormal Discretionary Expenses Negative Residuals

a. FTSE 100 Dependent Variable: ABNORMAL DISCRETIONARY EXPENSES (Negative Residuals) Predictors: (Constant), Working capital, Debt to Equity, time, Debt to EBITDA, DISCRETIONARY ACCRUALS, change in GDP, tax rate, Debt ratio, ABNORMAL PRODUCTION, Times interest earned, ABNORMAL CASH FLOWS, financial crisis, Quick ratio, return in equity, Risk of bankruptcy

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.117	15	.008	10.792	.000
	Residual	.397	549	.001		
	Total	.514	564			

Coefficient						
				T	P-value	95.0% Confidence Interval for B
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	-0.069	0.003		-20.849	0.000	-0.076	-0.063
DISCRETIONARY ACCRUALS	0.000	0.000	-0.025	-0.635	0.526	-0.001	0.001
ABNORMAL CASH FLOWS	-0.009	0.015	-0.023	-0.571	0.568	-0.038	0.021
ABNORMAL PRODUCTION	0.008	0.004	0.094	2.306	0.021	0.001	0.015
Time	0.002	0.000	0.329	7.876	0.000	0.002	0.003
financial crisis	-0.005	0.004	-0.063	-1.495	0.135	-0.012	0.002
change in GDP	0.000	0.001	-0.008	-0.205	0.838	-0.001	0.001
return in equity	-0.001	0.001	-0.076	-1.038	0.300	-0.004	0.001
Risk of bankruptcy	-0.005	0.001	-0.737	-6.417	0.000	-0.006	-0.003
tax rate	-0.003	0.002	-0.065	-1.716	0.087	-0.007	0.000
Debt ratio	0.000	0.000	0.680	6.002	0.000	0.000	0.000
Debt to EBITDA	0.000	0.000	-0.048	-1.259	0.208	0.000	0.000
Debt to Equity	0.000	0.000	0.061	0.838	0.403	0.000	0.001
Quick ratio	0.000	0.003	0.006	0.097	0.923	-0.005	0.005
Times interest earned	0.000	0.000	0.061	1.521	0.129	0.000	0.000
Working capital	0.002	0.002	0.056	0.906	0.365	-0.002	0.006

FTSE 100 Dependent Variable: ABNORMAL DISCRETIONARY EXPENSES (Negative Residuals)

APPENDIX LXVIII- FTSE 100 REM Least Squares Regression for Abnormal Cash Flows Negative Residuals

. FTSE 100 Dependent Variable: ABNORMAL CASH FLOWS (Negative Residuals) Predictors: (Constant), Working capital, ABNORMAL DISCRETIONARY EXPENSES, Time, Debt to Equity, Debt to EBITDA, change in GDP, tax rate, Debt ratio, DISCRETIONARY ACCRUALS, ABNORMAL PRODUCTION, Times interest earned, return in equity, financial crisis, Quick ratio, Risk of bankruptcy

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.483	15	.032	21.149	.000
	Residual	.554	364	.002		
	Total	1.037	379			

Coefficient

	B	Std. Error	Beta	T	P-Value	95.0% Confidence Interval for B Lower Bound	Upper Bound
(Constant)	-0.036	0.006		-5.729	0.000	-0.048	-0.024
DISCRETIONARY ACCRUALS	0.012	0.005	0.106	2.284	0.023	0.002	0.023
ABNORMAL PRODUCTION	0.061	0.005	0.496	11.15	0.000	0.050	0.072
ABNORMAL DISCRETIONARY EXPENSES	0.064	0.018	0.135	3.48	0.001	0.028	0.100
Time	0.002	0.001	0.173	3.933	0.000	0.001	0.003
financial crisis	0.001	0.007	0.004	0.08	0.936	-0.013	0.015
change in GDP	0.000	0.001	-0.009	-0.231	0.817	-0.002	0.002
return in equity	-0.005	0.004	-0.06	-1.262	0.208	-0.013	0.003
Risk of bankruptcy	-0.004	0.001	-0.389	-3.883	0.000	-0.007	-0.002
tax rate	-0.005	0.004	-0.041	-1.045	0.297	-0.013	0.004
Debt ratio	7.58E-06	0.000	0.339	3.457	0.001	0.000	0.000
Debt to EBITDA	0.000	0.000	0.023	0.576	0.565	0.000	0.000
Debt to Equity	-0.001	0.001	-0.042	-0.925	0.356	-0.002	0.001
Quick ratio	0.001	0.005	0.015	0.279	0.780	-0.008	0.011
Times interest earned	-8.54E-05	0.000	-0.043	-0.976	0.330	0.000	0.000
Working capital	-0.011	0.004	-0.152	-2.805	0.005	-0.018	-0.003

FTSE 100 Dependent Variable: ABNORMAL CASH FLOWS (Negative Residuals)

APPENDIX LXIX- FTSE 100 REM Least Squares Regression for Abnormal Production Costs Negative Residuals

. FTSE 100 Dependent Variable: ABNORMAL PRODUCTION (Negative Residuals) Predictors: (Constant), Working capital, tax rate, DISCRETIONARY ACCRUALS, Debt to Equity, change in GDP, ABNORMAL DISCRETIONARY EXPENSES, Debt to EBITDA, Debt ratio, Time, Times interest earned, ABNORMAL CASH FLOWS, financial crisis, Risk of bankruptcy, Quick ratio, return in equity

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	23.626	15	1.575	24.045	.000[b]
	Residual	24.564	375	.066		
	Total	48.190	390			

Coefficient

				T	P-value	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	-0.176	0.048		-3.657	0.000	-0.271	-0.081
DISCRETIONARY ACCRUALS	-0.024	0.004	-0.236	-6.089	0.000	-0.032	-0.016
ABNORMAL CASH FLOWS	1.902	0.158	0.502	12.018	0.000	1.590	2.213
ABNORMAL DISCRETIONARY EXPENSES	-0.107	0.071	-0.056	-1.499	0.135	-0.248	0.033
Time	0.018	0.004	0.216	5.135	0.000	0.011	0.025
financial crisis	0.116	0.043	0.113	2.687	0.008	0.031	0.200
change in GDP	0.011	0.006	0.067	1.736	0.083	-0.001	0.024
return in equity	-0.017	0.013	-0.140	-1.333	0.183	-0.042	0.008
Risk of bankruptcy	-0.146	0.020	-0.505	-7.472	0.000	-0.184	-0.107
tax rate	-0.072	0.039	-0.068	-1.813	0.071	-0.149	0.006
Debt ratio	0.000	0.000	0.364	6.051	0.000	0.000	0.000
Debt to EBITDA	-0.001	0.002	-0.020	-0.539	0.591	-0.006	0.003
Debt to Equity	0.003	0.002	0.163	1.555	0.121	-0.001	0.007
Quick ratio	-0.099	0.046	-0.212	-2.132	0.034	-0.190	-0.008
Times interest earned	0.000	0.000	-0.058	-1.539	0.125	0.000	0.000
Working capital	0.100	0.043	0.244	2.346	0.019	0.016	0.184

FTSE 100 Dependent Variable: ABNORMAL PRODUCTION (Negative Residuals)

APPENDIX LXX- FTSE 250 REM Least Squares Regression for Abnormal Cash Flows Negative Residuals

FTSE 250 Dependent Variable: ABNORMAL CASH FLOWS (Negative Residuals) Predictors: (Constant), Working capital, Debt to EBITDA, DISCRETIONARY ACCRUALS, ABNORMAL DISCRETIONARY EXPENSES, return in equity, change in GDP, ABNORMAL PRODUCTION, tax rate, Quick ratio, time, financial crisis, Debt ratio, Risk of bankruptcy, Debt to Equity

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.159	14	.011	4.878	.000[b]
	Residual	1.836	786	.002		
	Total	1.995	800			

Coefficient							
				T	p-value	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	0.007	0.005		1.355	0.176	-0.003	0.017
DISCRETIONARY ACCRUALS	0.001	0.022	0.002	0.055	0.956	-0.041	0.044
ABNORMAL PRODUCTION	-0.030	0.004	-0.269	-7.503	0.000	-0.038	-0.022
ABNORMAL DISCRETIONARY EXPENSES	0.002	0.014	0.004	0.122	0.903	-0.026	0.029
Time	0.000	0.000	0.006	0.156	0.876	-0.001	0.001
financial crisis	0.000	0.005	0.001	0.023	0.982	-0.011	0.011
change in GDP	0.000	0.001	0.003	0.089	0.929	-0.002	0.002
return in equity	-0.001	0.002	-0.106	-0.729	0.466	-0.004	0.002
Risk of bankruptcy	-0.003	0.001	-0.138	-2.390	0.017	-0.005	0.000
tax rate	0.000	0.001	-0.006	-0.183	0.855	-0.003	0.002
Debt ratio	0.000	0.000	0.114	1.990	0.047	0.000	0.000
Debt to EBITDA	0.000	0.000	-0.026	-0.754	0.451	0.000	0.000
Debt to Equity	0.000	0.000	0.105	0.722	0.471	0.000	0.001
Quick ratio	-0.001	0.002	-0.023	-0.664	0.507	-0.006	0.003
Working capital	0.000	0.000	0.012	0.300	0.764	0.000	0.000

FTSE 250 Dependent Variable: ABNORMAL CASH FLOWS (Negative Residuals)

APPENDIX LXXI- FTSE 250 REM Least Squares Regression for Abnormal Discretionary Expenses Negative Residuals

c. FTSE 250 Dependent Variable: ABNORMAL DISCRETIONARY EXPENSES (Negative Residuals) Predictors: (Constant), Working capital, ABNORMAL PRODUCTION, change in GDP, tax rate, Debt to Equity, DISCRETIONARY ACCRUALS, Times interest earned, Debt to EBITDA, financial crisis, ABNORMAL CASH FLOWS, time, Risk of bankruptcy, return in equity, Debt ratio, Quick ratio

d.

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.461	15	.031	13.663	.000[b]
	Residual	2.181	970	.002		
	Total	2.641	985			

Coefficient							
				t	P-value	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	-0.079	0.004		-19.255	0.000	-0.087	-0.071
DISCRETIONARY ACCRUALS	0.000	0.006	-0.001	-0.049	0.961	-0.012	0.011
ABNORMAL PRODUCTION	-0.007	0.004	-0.058	-1.765	0.078	-0.015	0.001
ABNORMAL CASH FLOWS	0.090	0.015	0.200	6.210	0.000	0.062	0.119
Time	0.002	0.000	0.129	3.971	0.000	0.001	0.003
financial crisis	-0.026	0.005	-0.174	-5.398	0.000	-0.035	-0.016
change in GDP	-0.002	0.001	-0.097	-3.193	0.001	-0.004	-0.001
return in equity	-0.003	0.002	-0.060	-1.471	0.142	-0.007	0.001
Risk of bankruptcy	-0.004	0.001	-0.259	-6.216	0.000	-0.005	-0.003
tax rate	-0.002	0.001	-0.054	-1.830	0.068	-0.004	0.000
Debt ratio	0.000	0.000	0.112	2.673	0.008	0.000	0.000
Debt to EBITDA	0.000	0.000	0.014	0.469	0.639	0.000	0.000
Debt to Equity	0.000	0.000	0.049	1.209	0.227	0.000	0.001
Quick ratio	-0.006	0.002	-0.115	-2.693	0.007	-0.011	-0.002
Times interest earned	0.000	0.000	0.038	1.135	0.257	0.000	0.000
Working capital	0.011	0.002	0.254	5.987	0.000	0.007	0.014

FTSE 250 Dependent Variable: ABNORMAL DISCRETIONARY EXPENSES (Negative Residuals)

APPENDIX LXXII- FTSE 250 REM Least Squares Regression for Abnormal Production Costs Negative Residuals

a. FTSE 250 Dependent Variable: ABNORMAL PRODUCTION (Negative Residuals) Predictors: (Constant), Working capital, ABNORMAL CASH FLOWS, Debt to Equity, Debt to EBITDA, financial crisis, ABNORMAL DISCRETIONARY EXPENSES, tax rate, Quick ratio, change in GDP, time, Debt ratio, Risk of bankruptcy, return in equity

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.746	13	.057	1.637	.071[b]
	Residual	20.443	583	.035		
	Total	21.189	596			

Coefficient

				T	p-value	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	-0.038	0.021		-1.813	0.070	-0.080	0.003
ABNORMAL CASH FLOWS	-0.009	0.134	-0.003	-0.067	0.946	-0.272	0.254
ABNORMAL DISCRETIONARY EXPENSES	-0.155	0.041	-0.155	-3.763	0.000	-0.236	-0.074
Time	-0.001	0.002	-0.015	-0.343	0.732	-0.005	0.003
financial crisis	-0.035	0.024	-0.066	-1.460	0.145	-0.082	0.012
change in GDP	0.001	0.004	0.007	0.161	0.872	-0.007	0.008
return in equity	0.001	0.005	0.018	0.117	0.907	-0.009	0.010
Risk of bankruptcy	-0.001	0.001	-0.044	-0.849	0.396	-0.003	0.001
tax rate	0.005	0.010	0.022	0.502	0.616	-0.014	0.024
Debt ratio	0.000	0.000	0.032	0.633	0.527	0.000	0.000
Debt to EBITDA	0.000	0.001	0.018	0.444	0.657	-0.001	0.001
Debt to Equity	0.000	0.001	-0.019	-0.125	0.901	-0.002	0.002
Quick ratio	0.015	0.009	0.072	1.685	0.093	-0.003	0.033
Working capital	0.000	0.000	-0.021	-0.394	0.694	0.000	0.000

FTSE 250 Dependent Variable: ABNORMAL PRODUCTION (Negative Residuals)

APPENDIX LXXIII- FTSE Small Cap REM Least Squares Regression for Abnormal Cash Flows Negative Residuals

a. FTSE Small Cap Dependent Variable: ABNORMAL CASH FLOWS (Negative Residuals) Predictors: (Constant), Working capital, Debt ratio, Debt to Equity, tax rate, Debt to EBITDA, financial crisi, DISCRETIONARY ACCRUALS, Times interest earned, ABNORMAL PRODUCTION, change in gdp, Risk of bankruptcy, time, return in equity, ABNORMAL DISCRETIONARY EXPENSES, Quick ratio

b.

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.212	15	.014	5.164	.000[b]
	Residual	1.107	405	.003		
	Total	1.318	420			

Coefficient

				T	P-value	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	-0.072	0.008		-8.596	0.000	-0.088	-0.056
DISCRETIONARY ACCRUALS	-0.103	0.028	-0.174	-3.686	0.000	-0.158	-0.048
ABNORMAL PRODUCTION	-0.061	0.010	-0.300	-5.868	0.000	-0.081	-0.040
ABNORMAL DISCRETIONARY EXPENSES	-0.051	0.011	-0.252	-4.818	0.000	-0.072	-0.030
Time	0.002	0.001	0.146	2.827	0.005	0.001	0.003
financial crisis	0.010	0.008	0.066	1.262	0.208	-0.005	0.025
change in GDP	0.002	0.001	0.061	1.267	0.206	-0.001	0.004
return in equity	0.001	0.002	0.034	0.658	0.511	-0.003	0.006
Risk of bankruptcy	0.000	0.000	-0.038	-0.756	0.450	0.000	0.000
tax rate	0.000	0.001	-0.002	-0.037	0.971	-0.003	0.003
Debt ratio	0.000	0.000	0.058	1.173	0.241	0.000	0.000
Debt to EBITDA	0.000	0.000	-0.003	-0.058	0.954	0.000	0.000
Debt to Equity	0.000	0.001	-0.033	-0.644	0.520	-0.002	0.001
Quick ratio	-0.009	0.008	-0.098	-1.132	0.258	-0.024	0.006
Times interest earned	0.000	0.000	0.082	1.740	0.083	0.000	0.000
Working capital	0.008	0.007	0.104	1.213	0.226	-0.005	0.021

FTSE Small Cap Dependent Variable: ABNORMAL CASH FLOWS (Negative Residuals)

APPENDIX LXXIV- FTSE Small Cap REM Least Squares Regression for Abnormal Discretionary Expenses Negative Residuals

b. FTSE Small Cap Dependent Variable: ABNORMAL DISCRETIONARY EXPENSES (Negative Residuals)
Predictors: (Constant), Working capital, change in GDP, return in equity, Times interest earned, tax rate, DISCRETIONARY ACCRUALS, Risk of bankruptcy, ABNORMAL PRODUCTION, Debt to EBITDA, time, financial crisis, ABNORMAL CASH FLOWS, Debt to Equity, Quick ratio, Debt ratio

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.856	15	.124	29.055	.000[b]
	Residual	2.428	570	.004		
	Total	4.284	585			

Coefficient

					95.0% Confidence Interval for B	
	B	Std. Error	Beta	t	P-value	Lower Bound	Upper Bound
(Constant)	-0.233	0.008		-30.381	0.000	-0.248	-0.218
DISCRETIONARY ACCRUALS	-0.057	0.032	-0.058	-1.773	0.077	-0.120	0.006
ABNORMAL PRODUCTION	-0.025	0.010	-0.089	-2.583	0.010	-0.045	-0.006
ABNORMAL CASH FLOWS	0.178	0.036	0.175	4.943	0.000	0.107	0.249
Time	0.012	0.001	0.563	16.220	0.000	0.010	0.013
financial crisis	0.030	0.008	0.125	3.561	0.000	0.014	0.047
change in GDP	0.002	0.001	0.051	1.541	0.124	-0.001	0.004
return in equity	-0.002	0.003	-0.033	-0.712	0.477	-0.007	0.003
Risk of bankruptcy	-0.001	0.000	-0.572	-6.914	0.000	-0.001	0.000
tax rate	0.003	0.003	0.034	1.070	0.285	-0.003	0.010
Debt ratio	0.000	0.000	0.521	6.301	0.000	0.000	0.000
Debt to EBITDA	0.000	0.000	0.008	0.246	0.805	0.000	0.001
Debt to Equity	0.000	0.001	0.003	0.067	0.946	-0.001	0.001
Quick ratio	0.014	0.008	0.110	1.750	0.081	-0.002	0.031
Times interest earned	0.000	0.000	0.013	0.393	0.695	0.000	0.000
Working capital	-0.005	0.007	-0.043	-0.686	0.493	-0.018	0.009

FTSE Small Cap Dependent Variable: ABNORMAL DISCRETIONARY EXPENSES (Negative Residuals)

APPENDIX LXXV- FTSE Small Cap REM Least Squares Regression for Abnormal Production Costs Negative Residuals

. FTSE Small Cap Dependent Variable: ABNORMAL PRODUCTION (Negative Rresiduals) Predictors: (Constant), Working capital, financial crisis, Debt ratio, return in equity, Debt to EBITDA, tax rate, DISCRETIONARY ACCRUALS, Times interest earned, ABNORMAL DISCRETIONARY EXPENSES, Risk of bankruptcy, change in GDP, ABNORMAL CASH FLOWS, time, Debt to Equity, Quick ratio

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.047	15	.270	5.708	.000[b]
	Residual	19.664	416	.047		
	Total	23.712	431			

				T	P-value	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	-0.22	0.03		-7.48	0.00	-0.28	-0.16
DISCRETIONARY ACCRUALS	-0.29	0.13	-0.11	-2.22	0.03	-0.54	-0.03
ABNORMAL CASH FLOWS	-0.53	0.08	-0.31	-6.38	0.00	-0.69	-0.37
ABNORMAL DISCRETIONARY EXPENSES	-0.12	0.03	-0.18	-3.78	0.00	-0.18	-0.06
Time	0.00	0.00	0.02	0.39	0.70	0.00	0.01
financial crisis	-0.03	0.03	-0.05	-1.04	0.30	-0.10	0.03
change in GDP	0.00	0.01	0.03	0.58	0.57	-0.01	0.01
return in equity	-0.03	0.02	-0.14	-1.82	0.07	-0.07	0.00
Risk of bankruptcy	0.00	0.00	0.00	-0.06	0.96	0.00	0.00
tax rate	-0.02	0.01	-0.06	-1.31	0.19	-0.04	0.01
Debt ratio	0.00	0.00	-0.01	-0.20	0.84	0.00	0.00
Debt to EBITDA	0.00	0.00	0.00	-0.02	0.98	0.00	0.00
Debt to Equity	0.01	0.00	0.09	1.13	0.26	0.00	0.01
Quick ratio	0.13	0.03	0.58	3.82	0.00	0.06	0.20
Times interest earned	0.00	0.00	-0.03	-0.65	0.51	0.00	0.00
Working capital	-0.09	0.03	-0.45	-2.97	0.00	-0.15	-0.03

FTSE Small Cap Dependent Variable: ABNORMAL PRODUCTION (Negative Residuals)

TWO STAGED LEAST SQUARES RESULTS

APPENDIX LXXVI-AEM Jones Positive Residuals

AEM +VE Jones		B	T	p-value	Model	ANOVA
FTSE100 +VE	(Constant)	0.486	2.017	0.044	R=0.136, R^2=0.018, Adj R^2=-0.010	F (5, 350) =2.179, p=0.088
	A. PROD	-0.386	-0.243	0.808		
	A. CASHFLOWS	18.122	1.833	0.068		
	A. D. EXPEN	-18.646	-2.227	0.027		
FTSE250+VE	(Constant)	0.080	12.373	0.000	R=0.140, R^2=0.020, Adj R^2=-0.016	F (5, 733) =4.920, p=0.002
	A. PROD	-0.100	-2.051	0.041		
	A. CASHFLOWS	0.100	0.679	0.498		
	A. D. EXPEN	-0.288	-1.623	0.105		
FTSE Small Caps +VE	(Constant)	0.140	3.082	0.002	R=0.131 R^2=0.017, Adj R^2=0.011	F (3, 542) =3.175, p=0.024
	A. PROD	-2.617	-2.632	0.009		
	A. CASHFLOWS	-1.506	-1.888	0.060		
	A. D. EXPEN	-0.651	-1.996	0.046		

APPENDIX LXXVII-AEM Jones Negative Residuals

AEM Jones Negatives		B	T	p-value	Model	ANOVA
FTSE100 –VE	(Constant)	-0.076	-0.617	0.538	R=0.172, R^2=0.030, Adj R^2=0.024	F (3, 501) =5.083, p=0.002
	A. PROD	-0.559	-0.485	0.628		
	A. CASHFLOWS	0.903	0.149	0.881		
	A. D. EXPEN	-12.418	-3.27	0.001		
FTSE250 –VE	(Constant)	-0.014	-0.608	0.543	R=0.106, R^2=0.011, Adj R^2=-0.008	F (5, 947) =3.613, p=0.013
	A. PROD	-0.227	-1.104	0.270		
	A. CASHFLOWS	-2.731	-2.750	0.006		
	A. D. EXPEN	1.628	2.653	0.008		
FTSE Small Caps –VE	(Constant)	-0.077	-12.143	0.000	R=0.041, R^2=0.002, Adj R^2=-0.003	F (3, 629) =0.349, p=0.790
	A. PROD	0.004	0.028	0.977		
	A. CASHFLOWS	0.127	0.761	0.447		
	A. D. EXPEN	0.125	0.974	0.330		

APPENDIX LXXVIII-FTSE 100 REM Two Stage Least Square Positive Residuals

REM FTSE100 +VES		B	t	p-value	ANOVA	Model
A. Cash Flows	(Constant)	0.018	1.018	0.309	F (5, 398) =3.02, p=0.030	R=0.149, R^2=0.022, Adj R^2=0.015
	D. Accruals	0.013	1.038	0.300		
	A. Production	-0.368	-2.591	0.010		
	A.D. Expenses	0.218	0.543	0.588		
A.D. Expenses	(Constant)	0.128	11.364	0.000	F (3, 215) =18.966, p=0.000	R=0.457, R^2=0.209, Adj R^2=0.198
	D. Accruals	-0.006	-0.519	0.605		
	A. Cashflows	1.022	3.167	0.002		
	A. Production	-0.420	-6.585	0.000		
A. Production	(Constant)	0.050	3.247	0.001	F (3,387) =12.319, p=0.000	R=0.295, R^2=0.085, Adj R^2=0.080
	D. Accruals	0.005	0.206	0.837		
	A. Cashflows	-1.022	-2.690	0.007		
	A.D. Expenses	-1.390	-3.000	0.003		

APPENDIX LXXIX- FTSE 250 REM Two Stage Least Square Positive Residuals

REM FTSE 250 +VES		B	T	p-value	ANOVA	Model
A. Cash Flows	(Constant)	0.061	6.513	0.000	F (3, 648) =6.004, p=0.002	R=0.164, R^2=0.027, Adj R^2=0.023
	D. Accruals	-0.139	-0.652	0.515		
	A. Production	-0.203	-3.053	0.002		
	A.D. Expenses	0.000	-0.003	0.998		
A.D. Expenses	(Constant)	0.192	12.060	0.000	F (3, 384) =3.838 p=0.010	R=0.177, R^2=0.029, Adj R^2=0.022
	D. Accruals	1.874	1.226	0.221		
	A. Cashflows	-0.883	-3.058	0.002		
	A. Production	-1.323	-2.076	0.039		
A. Production	(Constant)	0.116	2.660	0.008	F (3,852) =10.031, p=0.000	R=0.185, R^2=0.032, Adj R^2=0.031
	D. Accruals	-5.756	-2.192	0.029		
	A. Cashflows	-5.538	-4.647	0.000		
	A.D. Expenses	2.192	1.209	0.227		

APPENDIX LXXX- FTSE Small Cap REM Two Stage Least Square Positive Residuals

REM FTSE Small CAPS +VES		B	T	p-value	ANOVA	Model
A. Cash Flows	(Constant)	0.076	5.835	0.000	F (3, 462) =4.515, p=0.004	R=0.169, R^2=0.028, Adj R^2=0.022
	D. Accruals	0.679	2.022	0.044		
	A. Production	-0.071	-0.767	0.443		
	A.D. Expenses	0.092	1.495	0.136		
A.D. Expenses	(Constant)	0.164	6.679	0.000	F (3, 297) =21.166 p=0.000	R=0.420, R^2=0.176, Adj R^2=0.168
	D. Accruals	0.187	0.468	0.640		
	A. Cashflows	-1.375	-7.800	0.000		
	A. Production	-0.633	-1.936	0.054		
A. Production	(Constant)	0.101	5.101	0.000	F (3,470) =11.716, p=0.000	R=0.246, R^2=0.070, Adj R^2=0.064
	D. Accruals	-0.400	-0.689	0.491		
	A. Cashflows	-0.325	-0.495	0.621		
	A.D. Expenses	-0.803	-3.107	0.002		

APPENDIX LXXXI- FTSE 100 REM Two Stage Least Square Negative Residuals

REM FTSE 100 -VES		B	T	p-value	ANOVA	Model
A. Cash Flows	(Constant)	-0.034	-4.972	0.000	F (3, 376) =16.424, p=0.000	R=0.340, R^2=0.116, Adj R^2=0.109
	D. Accruals	0.027	1.938	0.053		
	A. Production	0.131	6.685	0.000		
	A.D. Expenses	0.498	1.584	0.114		
A.D. Expenses	(Constant)	-0.058	-25.285	0.000	F (3, 561) =10.457p=0.000	R=0.230, R^2=0.053, Adj R^2=0.048
	D. Accruals	-0.006	-0.466	0.641		
	A. Cashflows	0.397	4.040	0.000		
	A. Production	0.046	2.448	0.015		
A. Production	(Constant)	-0.388	-3.692	0.000	F (3,387) =9.701, p=0.000	R=0.264, R^2=0.070, Adj R^2=0.063
	D. Accruals	0.096	1.665	0.097		
	A. Cashflows	3.680	4.019	0.000		
	A.D. Expenses	0.604	0.327	0.744		

APPENDIX LXXXII- FTSE 250 REM Two Stage Least Square Negative Residuals

REM FTSE 250 -VES		B	t	p-value	ANOVA	Model
A. Cash Flows	(Constant)	-0.043	-4.845	0.000	F (3, 797) =14.603, p=0.000	R=0.228, R^2=0.052, Adj R^2=0.049
	D. Accruals	-0.764	-2.105	0.036		
	A. Production	-0.158	-4.710	0.000		
	A.D. Expenses	0.274	1.617	0.106		
A.D. Expenses	(Constant)	-0.085	-26.181	0.000	F (3, 982) =3.241p=0.021	R=0.099, R^2=0.010, Adj R^2=0.007
	D. Accruals	-0.135	-0.502	0.615		
	A. Cashflows	0.051	0.848	0.397		
	A. Production	0.056	0.215	0.830		
A. Production	(Constant)	-0.386	-3.688	0.000	F (3,387) =9.892, p=0.000	R=0.267, R^2=0.071, Adj R^2=0.064
	D. Accruals	0.095	1.650	0.100		
	A. Cashflows	3.709	4.062	0.000		
	A.D. Expenses	0.552	0.300	0.764		

APPENDIX LXXXIII- FTSE Small Cap REM Two Stage Least Square Negative Residuals

REM FTSE Small CAPS -VES		B	t	p-value	ANOVA	Model
A. Cash Flows	(Constant)	-0.047	-9.267	0.000	F (3, 417) =2.292, p=0.078	R=0.127, R^2=0.016, Adj R^2=0.009
	D. Accruals	-0.139	-1.038	0.300		
	A. Production	-0.187	-2.102	0.036		
	A.D. Expenses	-0.119	-1.732	0.084		
A.D. Expenses	(Constant)	-0.127	-7.478	0.000	F (3, 582) =5.314p=0.001	R=0.163, R^2=0.027, Adj R^2=0.022
	D. Accruals	-2.727	-3.004	0.003		
	A. Cashflows	-0.459	-1.464	0.144		
	A. Production	0.428	0.519	0.604		
A. Production	(Constant)	-0.248	-7.272	0.000	F (3,430) =3.851, p=0.010	R=0.162, R^2=0.026, Adj R^2=0.019
	D. Accruals	-0.523	-0.631	0.529		
	A. Cashflows	-0.908	-2.186	0.029		
	A.D. Expenses	0.340	1.981	0.048		

APPENDIX LXXXIV-Correlation for AEM JONES Positive Residuals

	Correlation for AEM JONES Combined +VE				
		D.ACCR	**A. PROD**	**A. C. FLOWS**	**A.D. EXPEN**
	D.ACCR	1	-0.095	.270**	-0.046
	P-value		0.071	0.000	0.384
	N	366	366	366	366
	A. PROD	-0.095	1	.228**	-.181**
	P-value	0.071		0.000	0.001
	N	366	366	366	366
	A. C. FLOWS	.270**	.228**	1	.218**
	P-value	0.000	0.000		0.000
	N	366	366	366	366
	A.D. EXPEN	-0.046	-.181**	.218**	1
	P-value	0.384	0.001	0.000	
FTSE100+VE	*N*	366	366	366	366
		D.ACCR	**A. PROD**	**A. C. FLOWS**	**A.D. EXPEN**
	D.ACCR	1	0.026	0.007	-0.022
	P-value		0.447	0.824	0.507
	N	884	884	884	884
	A. PROD	0.026	1	-.255**	-.245**
	P-value	0.447		0.000	0.000
	N	884	884	884	884
	A. C. FLOWS	0.007	-.255**	1	.135**
	P-value	0.824	0.000		0.000
	N	884	884	884	884
	A.D. EXPEN	-0.022	-.245**	.135**	1
	P-value	0.507	0.000	0.000	
FTSE250+VE	*N*	884	884	884	884
		D.ACCR	**A. PROD**	**A. C. FLOWS**	**A.D. EXPEN**
	D.ACCR	1	0.017	-.135**	-0.024
	P-value		0.664	0.001	0.534
	N	656	656	656	656
	A. PROD	0.017	1	-.376**	-.314**
	P-value	0.664		0.000	0.000
	N	656	656	656	656
	A. C. FLOWS	-.135**	-.376**	1	-.114**
	P-value	0.001	0.000		0.004
	N	656	656	656	656
	A.D. EXPEN	-0.024	-.314**	-.114**	1
	P-value	0.534	0.000	0.004	
FTSE SMALL CAPS	*N*	656	656	656	656
	** Correlation is significant at the 0.01 level (2-tailed).				

APPENDIX LXXXV-Correlation for AEM JONES Negatives Residuals

	Correlation for AEM JONES Combined -VE				
		D.ACCR	**A. PROD**	**A. C. FLOWS**	**A.D. EXPEN**
	D.ACCR	1	-0.027	-0.017	-0.083
	P-value		0.546	0.697	0.061
	N	509	509	509	509
	A. PROD	-0.027	1	0.021	-.306**
	P-value	0.546		0.637	0.000
	N	509	509	509	509
	A. C. FLOWS	-0.017	0.021	1	.119**
	P-value	0.697	0.637		0.007
	N	509	509	509	509
	A.D. EXPEN	-0.083	-.306**	.119**	1
	P-value	0.061	0.000	0.007	
FTSE100-VE	*N*	509	509	509	509
		D.ACCR	**A. PROD**	**A. C. FLOWS**	**A.D. EXPEN**
	D.ACCR	1	0.037	-0.052	0.015
	P-value		0.220	0.086	0.611
	N	1095	1095	1095	1095
	A. PROD	0.037	1	-.318**	-.198**
	P-value	0.22		0.000	0.000
	N	1095	1095	1095	1095
	A. C. FLOWS	-0.052	-.318**	1	.214**
	P-value	0.086	0.000		0.000
	N	1095	1095	1095	1095
	A.D. EXPEN	0.015	-.198**	.214**	1
	P-value	0.611	0.000	0.000	
FTSE250-VE	*N*	1095	1095	1095	1095
		D.ACCR	**A. PROD**	**A. C. FLOWS**	**A.D. EXPEN**
	D.ACCR	1	0.059	0.025	-.120**
	P-value		0.099	0.486	0.001
	N	776	776	776	776
	A. PROD	0.059	1	-.418**	-.448**
	P-value	0.099		0.000	0.000
	N	776	776	776	776
	A. C. FLOWS	0.025	-.418**	1	.215**
	P-value	0.486	0.000		0.000
	N	776	776	776	776
	A.D. EXPEN	-.120**	-.448**	.215**	1
	P-value	0.001	0.000	0.000	
FTSE SMALL CAPS	*N*	776	776	776	776
** Correlation is significant at the 0.01 level (2-tailed).					

APPENDIX LXXXVI-REM CORRELATIONS Discretionary Expenses Negative Residuals

Correlation for REM Discretionary Expenses Negative residuals					
		A. C. FLOWS	**D.ACCR**	**A. PROD**	**A.D. EXPEN**
	A. C. FLOWS	1	0.041	.576**	0.068
	P-value		0.418	0.000	0.184
	N	385	385	385	385
	D.ACCR	0.041	1	-0.048	-0.027
	P-value	0.418		0.352	0.597
	N	385	385	385	385
	A. PROD	.576**	-0.048	1	-.129*
	P-value	0.000	0.352		0.011
	N	385	385	385	385
	A.D. EXPEN	0.068	-0.027	-.129*	1
	P-value	0.184	0.597	0.011	
FTSE100-VE	*N*	385	385	385	385
		A. C. FLOWS	**D.ACCR**	**A. PROD**	**A.D. EXPEN**
	A. C. FLOWS	1	-.253**	-.353**	.147**
	P-value		0.000	0.000	0.000
	N	857	857	857	857
	D.ACCR	-.253**	1	.089**	-0.032
	P-value	0.000		0.009	0.354
	N	857	857	857	857
	A. PROD	-.353**	.089**	1	-.145**
	P-value	0.000	0.009		0.000
	N	857	857	857	857
	A.D. EXPEN	.147**	-0.032	-.145**	1
	P-value	0.000	0.354	0.000	
FTSE250-VE	*N*	857	857	857	857
		A. C. FLOWS	**D.ACCR**	**A. PROD**	**A.D. EXPEN**
	A. C. FLOWS	1	-.212**	-.244**	-0.072
	P-value		0.000	0.000	0.121
	N	469	469	469	469
	D.ACCR	-.212**	1	.103*	-.123**
	P-value	0.000		0.025	0.008
	N	469	469	469	469
	A. PROD	-.244**	.103*	1	-.419**
	P-value	0.000	0.025		0.000
	N	469	469	469	469
	A.D. EXPEN	-0.072	-.123**	-.419**	1
FTSE SMALL CAPS – VE	*P-value*	0.121	0.008	0.000	
	N	469	469	469	469
** Correlation is significant at the 0.01 level (2-tailed).					

APPENDIX LXXXVII- REM CORRELATIONS Abnormal Cash Flows Negative Residuals

Correlation for REM Abnormal Cash Flows Negative Residuals					
		A. C. FLOWS	**D.ACCR**	**A. PROD**	**A.D. EXPEN**
FTSE100-VE	**A. C. FLOWS**	1	-0.036	0.072	.167**
	P-value		0.389	0.084	0.000
	N	573	573	573	573
	D.ACCR	-0.036	1	.227**	-.098*
	P-value	0.389		0.000	0.020
	N	573	573	573	573
	A. PROD	0.072	.227**	1	.171**
	P-value	0.084	0.000		0.000
	N	573	573	573	573
	A.D. EXPEN	.167**	-.098*	.171**	1
	P-value	0.000	0.020	0.000	
	N	573	573	573	573
FTSE250-VE		**A. C. FLOWS**	**D.ACCR**	**A. PROD**	**A.D. EXPEN**
	A. C. FLOWS	1	-0.016	-0.045	.120**
	P-value		0.592	0.134	0.000
	N	1107	1107	1107	1107
	D.ACCR	-0.016	1	.072*	-.130**
	P-value	0.592		0.017	0.000
	N	1107	1107	1107	1107
	A. PROD	-0.045	.072*	1	-.384**
	P-value	0.134	0.017		0.000
	N	1107	1107	1107	1107
	A.D. EXPEN	.120**	-.130**	-.384**	1
	P-value	0.000	0.000	0.000	
	N	1107	1107	1107	1107
FTSE SMALL CAPS -VE		**A. C. FLOWS**	**D.ACCR**	**A. PROD**	**A.D. EXPEN**
	A. C. FLOWS	1	-.244**	-.203**	.185**
	P-value		0.000	0.000	0.000
	N	664	664	664	664
	D.ACCR	-.244**	1	.089*	-.212**
	P-value	0.000		0.022	0.000
	N	664	664	664	664
	A. PROD	-.203**	.089*	1	-.345**
	P-value	0.000	0.022		0.000
	N	664	664	664	664
	A.D. EXPEN	.185**	-.212**	-.345**	1
	P-value	0.000	0.000	0.000	
	N	664	664	664	664
** Correlation is significant at the 0.01 level (2-tailed).					

APPENDIX LXXXVIII- REM CORRELATIONS Abnormal Production Costs Negative Residuals

Correlation for REM Abnormal production costs Negative residuals					
		A. C. FLOWS	**D.ACCR**	**A. PROD**	**A.D. EXPEN**
FTSE100-VE	**A. C. FLOWS**	1	-0.084	.518**	0.01
	P-value		0.094	0.000	0.843
	N	399	399	399	399
	D.ACCR	-0.084	1	.210**	-0.059
	P-value	0.094		0.000	0.242
	N	399	399	399	399
	A. PROD	.518**	.210**	1	0.096
	P-value	0.000	0.000		0.055
	N	399	399	399	399
	A.D. EXPEN	0.01	-0.059	0.096	1
	P-value	0.843	0.242	0.055	
	N	399	399	399	399
FTSE250-VE		**A. C. FLOWS**	**D.ACCR**	**A. PROD**	**A.D. EXPEN**
	A. C. FLOWS	1	-0.084	.512**	-0.004
	P-value		0.094	0.000	0.936
	N	399	399	399	399
	D.ACCR	-0.084	1	.210**	-0.059
	P-value	0.094		0.000	0.242
	N	399	399	399	399
	A. PROD	.512**	.210**	1	0.096
	P-value	0.000	0.000		0.055
	N	399	399	399	399
	A.D. EXPEN	-0.004	-0.059	0.096	1
	P-value	0.936	0.242	0.055	
	N	399	399	399	399
FTSE SMALL CAPS -VE		**A. C. FLOWS**	**D.ACCR**	**A. PROD**	**A.D. EXPEN**
	A. C. FLOWS	1	-0.013	-.322**	-.089*
	P-value		0.776	0.000	0.049
	N	490	490	490	490
	D.ACCR	-0.013	1	-.159**	-0.072
	P-value	0.776		0.000	0.112
	N	490	490	490	490
	A. PROD	-.322**	-.159**	1	-0.025
	P-value	0.000	0.000		0.582
	N	490	490	490	490
	A.D. EXPEN	-.089*	-0.072	-0.025	1
	P-value	0.049	0.112	0.582	
	N	490	490	490	490
** Correlation is significant at the 0.01 level (2-tailed).					

APPENDIX LXXXIX- REM CORRELATIONS Abnormal Cash Flows Positive Residuals

Correlation for REM Abnormal Cash Flows Positive Residuals					
		A. C. FLOWS	**D.ACCR**	**A. PROD**	**A.D. EXPEN**
FTSE100 +VE	**A. C. FLOWS**	1	.324**	-.436**	0.018
	P-value		0.000	0.000	0.721
	N	413	413	413	413
	D.ACCR	.324**	1	-.202**	-0.057
	P-value	0.000		0.000	0.246
	N	413	413	413	413
	A. PROD	-.436**	-.202**	1	-.499**
	P-value	0.000	0.000		0.000
	N	413	413	413	413
	A.D. EXPEN	0.018	-0.057	-.499**	1
	P-value	0.721	0.246	0.000	
	N	413	413	413	413
FTSE250+VE		**A. C. FLOWS**	**D.ACCR**	**A. PROD**	**A.D. EXPEN**
	A. C. FLOWS	1	-0.001	-.248**	-0.005
	P-value		0.97	0.000	0.896
	N	793	793	793	793
	D.ACCR	-0.001	1	0.011	0.042
	P-value	0.97		0.758	0.234
	N	793	793	793	793
	A. PROD	-.248**	0.011	1	-.318**
	P-value	0.000	0.758		0.000
	N	793	793	793	793
	A.D. EXPEN	-0.005	0.042	-.318**	1
	P-value	0.896	0.234	0.000	
	N	793	793	793	793
FTSE SMALL CAPS +VE		**A. C. FLOWS**	**D.ACCR**	**A. PROD**	**A.D. EXPEN**
	A. C. FLOWS	1	-0.077	-.324**	.134**
	P-value		0.07	0.000	0.002
	N	559	559	559	559
	D.ACCR	-0.077	1	0.049	-0.040
	P-value	0.070		0.250	0.348
	N	559	559	559	559
	A. PROD	-.324**	0.049	1	-.380**
	P-value	0.000	0.25		0.000
	N	559	559	559	559
	A.D. EXPEN	.134**	-0.040	-.380**	1
	P-value	0.002	0.348	0.000	
	N	559	559	559	559
** Correlation is significant at the 0.01 level (2-tailed).					

APPENDIX XC- REM CORRELATIONS Abnormal Discretionary Expenses Positive Residuals

Correlation for REM Abnormal Discretionary Expenses Positive Residuals					
		A. C. FLOWS	**D.ACCR**	**A. PROD**	**A.D. EXPEN**
FTSE100+VE	**A. C. FLOWS**	1	-0.124	.405**	-.642**
	P-value		0.063	0.000	0.000
	N	227	227	227	227
	D.ACCR	-0.124	1	-0.124	0.039
	P-value	0.063		0.061	0.563
	N	227	227	227	227
	A. PROD	.405**	-0.124	1	0.064
	P-value	0.000	0.061		0.337
	N	227	227	227	227
	A.D. EXPEN	-.642**	0.039	0.064	1
	P-value	0.000	0.563	0.337	
	N	227	227	227	227
FTSE250+VE		**A. C. FLOWS**	**D.ACCR**	**A. PROD**	**A.D. EXPEN**
	A. C. FLOWS	1	0.045	-.353**	0.044
	P-value		0.340	0.000	0.345
	N	456	456	456	456
	D.ACCR	0.045	1	0.031	-.131**
	P-value	0.34		0.509	0.005
	N	456	456	456	456
	A. PROD	-.353**	0.031	1	-.385**
	P-value	0.000	0.509		0.000
	N	456	456	456	456
	A.D. EXPEN	0.044	-.131**	-.385**	1
	P-value	0.345	0.005	0.000	
	N	456	456	456	456
FTSE SMALL CAPS +VE		**A. C. FLOWS**	**D.ACCR**	**A. PROD**	**A.D. EXPEN**
	A. C. FLOWS	1	0.039	-.685**	-0.049
	P-value		0.455	0.000	0.348
	N	364	364	364	364
	D.ACCR	0.039	1	.108*	-.123*
	P-value	0.455		0.039	0.019
	N	364	364	364	364
	A. PROD	-.685**	.108*	1	-.440**
	P-value	0.000	0.039		0.000
	N	364	364	364	364
	A.D. EXPEN	-0.049	-.123*	-.440**	1
	P-value	0.348	0.019	0.000	
	N	364	364	364	364
** Correlation is significant at the 0.01 level (2-tailed).					

APPENDIX XCI- REM CORRELATIONS Abnormal Production Costs Positive Residuals

Correlation for REM Abnormal Production Positive Residuals					
		A. C. FLOWS	**D.ACCR**	**A. PROD**	**A.D. EXPEN**
FTSE100+VE	**A. C. FLOWS**	1	0.003	-.534**	-.315**
	P-value		0.958	0.000	0.000
	N	399	399	399	399
	D.ACCR	0.003	1	.160**	0.019
	P-value	0.958		0.001	0.700
	N	399	399	399	399
	A. PROD	-.534**	.160**	1	0.038
	P-value	0.000	0.001		0.446
	N	399	399	399	399
	A.D. EXPEN	-.315**	0.019	0.038	1
	P-value	0.000	0.700	0.446	
	N	399	399	399	399
FTSE250+VE		**A. C. FLOWS**	**D.ACCR**	**A. PROD**	**A.D. EXPEN**
	A. C. FLOWS	1	.101**	-.363**	-.070*
	P-value		0.002	0.000	0.032
	N	924	924	924	924
	D.ACCR	.101**	1	-.306**	-0.057
	P-value	0.002		0.000	0.084
	N	924	924	924	924
	A. PROD	-.363**	-.306**	1	.143**
	P-value	0.000	0.000		0.000
	N	924	924	924	924
	A.D. EXPEN	-.070*	-0.057	.143**	1
	P-value	0.032	0.084	0.000	
	N	924	924	924	924
FTSE SMALL CAPS +VE		**A. C. FLOWS**	**D.ACCR**	**A. PROD**	**A.D. EXPEN**
	A. C. FLOWS	1	.118**	-.295**	-.505**
	P-value		0.006	0.000	0.000
	N	538	538	538	538
	D.ACCR	.118**	1	-.173**	-0.050
	P-value	0.006		0.000	0.243
	N	538	538	538	538
	A. PROD	-.295**	-.173**	1	.132**
	P-value	0.000	0.000		0.002
	N	538	538	538	538
	A.D. EXPEN	-.505**	-0.05	.132**	1
	P-value	0.000	0.243	0.002	
	N	538	538	538	538
** Correlation is significant at the 0.01 level (2-tailed).					

APPENDIX XCII-MULTICOLLINEARITY for AEM

FTSE 100 NEGATIVE RESIDUALS	*TOTAL ACCRUALS*	*PROPERTY PLAND AND EQUIPMENT*	*CHANGE IN REVENUE*
TOTAL ACCRUALS	1		
PROPERTY PLAND AND EQUIPMENT	0.054549375	1	
CHANGE IN REVENUE	0.184676399	0.865845538	1
FTSE 250 NEGATIVE RESIDUALS	*TOTAL ACCRUALS*	*PROPERTY PLAND AND EQUIPMENT*	*CHANGE IN REVENUE*
TOTAL ACCRUALS	1		
PROPERTY PLAND AND EQUIPMENT	0.027781589	1	
CHANGE IN REVENUE	0.532948379	0.250242104	1
FTSE SMALL CAP NEGATIVE RESIDUALS	*TOTAL ACCRUALS*	*PROPERTY PLAND AND EQUIPMENT*	*CHANGE IN REVENUE*
TOTAL ACCRUALS	1		
PROPERTY PLAND AND EQUIPMENT	0.011843442	1	
CHANGE IN REVENUE	0.349423614	0.538065846	1
FTSE 100 POSITIVE RESIDUALS	*TOTAL ACCRUALS*	*PROPERTY PLAND AND EQUIPMENT*	*CHANGE IN REVENUE*
TOTAL ACCRUALS	1		
PROPERTY PLAND AND EQUIPMENT	-0.141670063	1	
CHANGE IN REVENUE	0.415082061	-0.206511282	1
FTSE250 POSITIVE RESIDUALS	*TOTAL ACCRUALS*	*PROPERTY PLAND AND EQUIPMENT*	*CHANGE IN REVENUE*
TOTAL ACCRUALS	1		
PROPERTY PLAND AND EQUIPMENT	-0.200935272	1	
CHANGE IN REVENUE	0.657661702	0.037722896	1
FTSE SMALL CAP POSITIVE RESIDUALS	*TOTAL ACCRUALS*	*PROPERTY PLAND AND EQUIPMENT*	*CHANGE IN REVENUE*
TOTAL ACCRUALS	1		
PROPERTY PLAND AND EQUIPMENT	-0.23620976	1	
CHANGE IN REVENUE	0.629636715	0.044555696	1

APPENDIX XCIII- MULTICOLLINEARITY for REM Abnormal Production Costs

FTSE 100 NEGATIVE RESIDUALS	*NORMAL PRODUCTION COSTS*	*1/(ASSET (t-1)*	*SALES/(ASSET (T-1)*	*CHANGE IN SALES/ASSETS (t-1)*
NORMAL PRODUCTION COSTS	1			
1/(ASSET (t-1)	0.125071695	1		
SALES/(ASSET (T-1)	0.986895956	0.203881	1	
CHANGE IN SALES/ASSETS (t-1)	0.48357962	0.251141	0.38068607	1
CHANGE IN SALES (t-1)/ASSETS(t-1)	0.169502616	0.13268	0.15693731	0.494982063
FTSE 250 NEGATIVE RESIDUALS	*NORMAL PRODUCTION COSTS*	*1/(ASSET (t-1)*	*SALES/(ASSET (T-1)*	*CHANGE IN SALES/ASSETS (t-1)*
NORMAL PRODUCTION COSTS	1			
1/(ASSET (t-1)	0.192891295	1		
SALES/(ASSET (T-1)	0.981534322	0.347728	1	
CHANGE IN SALES/ASSETS (t-1)	0.631975787	0.020612	0.53405323	1
CHANGE IN SALES (t-1)/ASSETS(t-1)	0.268841853	0.21852	0.2470525	0.140182876
FTSE SMALL CAP NEGATIVE RESIDUALS	*NORMAL PRODUCTION COSTS*	*1/(ASSET (t-1)*	*SALES/(ASSET (T-1)*	*CHANGE IN SALES/ASSETS (t-1)*
NORMAL PRODUCTION COSTS	1			
1/(ASSET (t-1)	0.141692794	1		
SALES/(ASSET (T-1)	0.991462817	0.26895	1	
CHANGE IN SALES/ASSETS (t-1)	0.075477967	0.014343	0.06343954	1
CHANGE IN SALES (t-1)/ASSETS(t-1)	-0.189113099	0.22902	-0.1580211	-0.007724753
FTSE 100 POSITIVE RESIDUALS	*NORMAL PRODUCTION COSTS*	*1/(ASSET (t-1)*	*SALES/(ASSET (T-1)*	*CHANGE IN SALES/ASSETS (t-1)*
NORMAL PRODUCTION COSTS	1			
1/(ASSET (t-1)	0.059808549	1		
SALES/(ASSET (T-1)	0.991151252	0.074475	1	
CHANGE IN SALES/ASSETS (t-1)	0.730673365	0.180683	0.64450517	1
CHANGE IN SALES (t-1)/ASSETS(t-1)	0.202321973	-0.01469	0.25716832	0.095403336

FTSE 250 POSITIVE RESIDUALS	*NORMAL PRODUCTION COSTS*	*1/(ASSET (t-1)*	*SALES/(ASSET (T-1)*	*CHANGE IN SALES/ASSETS (t-1)*
NORMAL PRODUCTION COSTS	1			
1/(ASSET (t-1)	-0.06490617	1		
SALES/(ASSET (T-1)	0.985313264	0.077637	1	
CHANGE IN SALES/ASSETS (t-1)	0.582897216	0.301386	0.57862765	1
CHANGE IN SALES (t-1)/ASSETS(t-1)	0.183470846	0.056274	0.13186975	-0.022923379
FTSE SMALL CAP POSITIVE RESIDUALS	*NORMAL PRODUCTION COSTS*	*1/(ASSET (t-1)*	*SALES/(ASSET (T-1)*	*CHANGE IN SALES/ASSETS (t-1)*
NORMAL PRODUCTION COSTS	1			
1/(ASSET (t-1)	-0.061057666	1		
SALES/(ASSET (T-1)	0.991828997	0.066297	1	
CHANGE IN SALES/ASSETS (t-1)	0.429562849	0.151382	0.44077544	1
CHANGE IN SALES (t-1)/ASSETS(t-1)	0.355613069	0.045903	0.35343549	0.355085561

APPENDIX XCIV- MULTICOLLINEARITY for REM Abnormal Cash Flows

FTSE 100 NEGATIVE	*NORMAL CASH FLOW*	*1/ASSETS (t-1)*	*SALES/ASSETS(t-1)*	*CHANGE IN SALES/ASSETS (t-1)*
NORMAL CASH FLOW	1			
1/ASSETS (t-1)	0.771882	1		
SALES/ASSETS(t-1)	0.926732	0.530894	1	
CHANGE IN SALES/ASSETS (t-1)	0.584113	0.399335	0.757666	1
FTSE 250 NEGATIVE	*NORMAL CASH FLOW*	*1/ASSETS (t-1)*	*SALES/ASSETS(t-1)*	*CHANGE IN SALES/ASSETS (t-1)*
NORMAL CASH FLOW	1			
1/ASSETS (t-1)	0.874243	1		
SALES/ASSETS(t-1)	0.625421	0.181588	1	
CHANGE IN SALES/ASSETS (t-1)	0.788619	0.52029	0.650175	1
FTSE SMALL CAP NEGATIVE	*Normal cash flow*	*1/ASSETS (t-1)*	*SALES/ASSETS(t-1)*	*CHANGE IN SALES/ASSETS (t-1)*
Normal cash flow	1			
1/ASSETS (t-1)	0.717793	1		
SALES/ASSETS(t-1)	0.793081	0.15049	1	
CHANGE IN SALES/ASSETS (t-1)	0.079107	0.066231	0.150468	1
FTSE 100 POSITIVE RESIDUALS	*NORMAL CASH FLOW*	*1/ASSETS (t-1)*	*SALES/ASSETS(t-1)*	*CHANGE IN SALES/ASSETS (t-1)*
NORMAL CASH FLOW	1			
1/ASSETS (t-1)	0.704564	1		
SALES/ASSETS(t-1)	0.72842	0.106533	1	
CHANGE IN SALES/ASSETS (t-1)	0.209703	0.305623	0.382749	1
FTSE 250 POSITIVE RESIDUALS	*NORMAL CASH FLOW*	*1/ASSETS (t-1)*	*SALES/ASSETS(t-1)*	*CHANGE IN SALES/ASSETS (t-1)*
NORMAL CASH FLOW	1			
1/ASSETS (t-1)	0.880385	1		

SALES/ASSETS(t-1)	0.836781	0.537445	1	
CHANGE IN SALES/ASSETS (t-1)	0.553123	0.243705	0.447814	1
FTSE SMALL CAP POSITIVE RESIDUALS	*Normal cash flow*	*1/ASSETS (t-1)*	*SALES/ASSETS(t-1)*	*CHANGE IN SALES/ASSETS (t-1)*
Normal cash flow	1			
1/ASSETS (t-1)	0.875298	1		
SALES/ASSETS(t-1)	0.766191	0.363154	1	
CHANGE IN SALES/ASSETS (t-1)	0.317954	0.156189	0.489095	1

APPENDIX XCV- MULTICOLLINEARITY for REM Abnormal Discretionary Expenses

FTSE 100 NEGATIVE RESIDUALS	*NORMAL DISCRETIONARY*	*1/TOTAL ASSET (t-1)*	*SALES/ TOTAL ASSET (t-1)*
NORMAL DISCRETIONARY	1		
1/TOTAL ASSET (t-1)	0.601462841	1	
SALES/ TOTAL ASSET (t-1)	0.982588605	0.442559083	1
FTSE 250 NEGATIVE RESIDUALS	*NORMAL DISCRETIONARY*	*1/TOTAL ASSET (t-1)*	*SALES/ TOTAL ASSET (t-1)*
NORMAL DISCRETIONARY	1		
1/TOTAL ASSET (t-1)	0.984943877	1	
SALES/ TOTAL ASSET (t-1)	0.361335757	0.194701165	1
FTSE SMALL CAP NEGATIVE RESIDUALS	*NORMAL DISCRETIONARY*	*1/TOTAL ASSET (t-1)*	*SALES/ TOTAL ASSET (t-1)*
NORMAL DISCRETIONARY	1		
1/TOTAL ASSET (t-1)	0.978001112	1	
SALES/ TOTAL ASSET (t-1)	0.415660386	0.216790762	1
FTSE 100 POSITIVE RESIDUALS	*NORMAL DISCRETIONARY*	*1/TOTAL ASSET (t-1)*	*SALES/ TOTAL ASSET (t-1)*
NORMAL DISCRETIONARY	1		
1/TOTAL ASSET (t-1)	0.366530392	1	
SALES/ TOTAL ASSET (t-1)	0.96446798	0.10769376	1
FTSE 250 POSITIVE RESIDUALS	*NORMAL DISCRETIONARY*	*1/TOTAL ASSET (t-1)*	*SALES/ TOTAL ASSET (t-1)*
NORMAL DISCRETIONARY	1		
1/TOTAL ASSET (t-1)	0.999302294	1	
SALES/ TOTAL ASSET (t-1)	0.484673665	0.451666776	1
FTSE SMALL CAP POSITIVE RESIDUALS	*NORMAL DISCRETIONARY*	*1/TOTAL ASSET (t-1)*	*SALES/ TOTAL ASSET (t-1)*
NORMAL DISCRETIONARY	1		
1/TOTAL ASSET (t-1)	0.980969488	1	
SALES/ TOTAL ASSET (t-1)	0.437995095	0.255112622	1

APPENDIX XCVI-FTSE 100 COLLINEARITY for AEM and VIF

AEM FTSE 100 Collinearity Statistics					
FTSE 100 +VE	**B**	**T**	**P-value**	**Tolerance**	**VIF**
(Constant)	0.196	0.346	0.730		
ABNORMAL PRODUCTION	-2.348	-4.455	0.000	0.754	1.326
ABNORMAL CASH FLOWS	15.225	6.599	0.000	0.787	1.271
ABNORMAL DISCRETIONARY EXPENSES	-3.37	-2.417	0.016	0.861	1.161
Time	-0.007	-0.148	0.882	0.805	1.243
Financial crisis	3.068	3.832	0.000	0.864	1.158
Change in GDP	-0.09	-0.854	0.394	0.943	1.061
Return in equity	-0.517	-1.463	0.144	0.621	1.611
Net operating assets	-3.70E-09	-0.812	0.417	0.946	1.057
Operating cycle	-2.96E-05	-0.052	0.959	0.801	1.249
Debt ratio	2.67E-05	0.395	0.693	0.947	1.056
Debt to EBITDA	0.077	1.024	0.306	0.853	1.173
Debt to Equity	0.05	0.859	0.391	0.633	1.58
Quick ratio	-0.26	-0.638	0.524	0.43	2.328
Times interest earned	-0.001	-0.563	0.574	0.889	1.125
Working capital	0.069	0.214	0.830	0.403	2.48
AEM FTSE 100 –VE	**B**	**T**	**p-value**	**Tolerance**	**VIF**
(Constant)	-0.037	-0.933	0.351		
ABNORMAL PRODUCTION	-0.053	-0.9	0.369	0.812	1.231
ABNORMAL CASH FLOWS	0.503	2.49	0.013	0.929	1.077
ABNORMAL DISCRETIONARY EXPENSES	0.023	0.224	0.823	0.856	1.168
Time	-0.004	-1.211	0.226	0.801	1.249
Financial crisis	-0.668	-16.845	0.000	0.79	1.266
Change in GDP	0.028	4.496	0.000	0.908	1.102
Return in equity	0.014	1.084	0.279	0.115	8.68
Net operating assets	9.96E-10	1.861	0.063	0.945	1.059
Operating cycle	-5.37E-05	-0.839	0.402	0.825	1.212
Debt Ratio	1.11E-05	0.92	0.358	0.870	1.15
Debt to EBITDA	-9.29E-05	-0.072	0.942	0.967	1.034
Debt to Equity	-0.001	-0.393	0.694	0.115	8.718
Quick ratio	0.076	1.967	0.050	0.327	3.055
Times interest earned	0.000	-30.757	0.000	0.963	1.038
Working capital	-0.049	-1.564	0.119	0.307	3.254

APPENDIX XCVII- FTSE 250 COLLINEARITY for AEM and VIF

AEM FTSE 250 +VE	B	T	p-value	Tolerance	VIF
(Constant)	0.056	7.025	0.000		
ABNORMAL PRODUCTION	0.016	1.844	0.066	0.725	1.379
ABNORMAL CASH FLOWS	-0.064	-2.273	0.023	0.741	1.349
ABNORMAL DISCRETIONARY EXPENSES	-0.013	-0.685	0.493	0.919	1.088
Time	-0.003	-4.087	0.000	0.816	1.226
Financial crisis	-0.001	-0.156	0.876	0.832	1.201
Change in GDP	-0.001	-0.646	0.518	0.921	1.086
Return in equity	0.003	0.862	0.389	0.633	1.580
Net operating assets	0.000	-0.744	0.457	0.965	1.036
Operating cycle	0.000	-2.254	0.025	0.974	1.026
Debt ratio	0.000	2.726	0.007	0.897	1.115
Debt to EBITDA	0.000	1.506	0.133	0.981	1.019
Debt to Equity	0.000	-0.644	0.520	0.633	1.581
Quick ratio	-0.007	-1.519	0.129	0.410	2.437
Times interest earned	0.000	-1.079	0.281	0.944	1.060
Working capital	0.019	5.020	0.000	0.443	2.259
AEM FTSE 250-VE	**B**	**t**	**p-value**	**Tolerance**	**VIF**
(Constant)	-0.034	-1.904	0.057		
ABNORMAL PRODUCTION	0.010	0.431	0.666	0.840	1.191
ABNORMAL CASH FLOWS	-0.064	-0.849	0.396	0.888	1.126
ABNORMAL DISCRETIONARY EXPENSES	0.028	0.516	0.606	0.931	1.074
Time	0.001	0.342	0.733	0.847	1.180
Financial crisis	-0.009	-0.418	0.676	0.845	1.183
Change in GDP	0.003	0.888	0.375	0.927	1.078
Return in equity	-0.001	-0.334	0.739	0.074	13.594
Net operating assets	0.000	-17.981	0.000	0.957	1.045
Operating cycle	0.000	1.958	0.051	0.628	1.591
Debt ratio	0.000	0.596	0.552	0.538	1.858
Debt to EBITDA	0.000	0.117	0.907	0.965	1.036
Debt to Equity	0.000	0.344	0.731	0.074	13.565
Quick ratio	0.010	0.581	0.561	0.298	3.356
Times interest earned	0.000	-0.085	0.932	0.622	1.608
Working capital	-0.018	-1.301	0.193	0.258	3.881

APPENDIX XCVIII- FTSE Small Cap COLLINEARITY for AEM and VIF

AEM FTSE SMALL CAPS +VE	B		P	Tolerance	VIF
(Constant)	0.057	1.85	0.065		
ABNORMAL PRODUCTION	-0.107	-2.04	0.042	0.685	1.459
ABNORMAL CASH FLOWS	-0.357	-3.187	0.002	0.730	1.370
ABNORMAL DISCRETIONARY EXPENSES	-0.081	-1.696	0.091	0.687	1.456
Time	0.002	0.618	0.537	0.855	1.170
Financial crisis	0.01	0.282	0.778	0.875	1.143
Change in GDP	-0.006	-1.197	0.232	0.927	1.078
Return in equity	0.121	6.664	0.000	0.842	1.187
Net operating assets	-8.04E-10	-0.029	0.977	0.953	1.050
Operating cycle	-6.40E-05	-4.417	0.000	0.925	1.082
Debt ratio	-5.40E-07	-0.218	0.827	0.992	1.008
Debt to EBITDA	0.002	4.985	0.000	0.954	1.048
Debt to Equity	-0.024	-5.365	0.000	0.836	1.196
Quick ratio	0.022	0.711	0.477	0.126	7.927
Times interest earned	9.15E-06	0.219	0.827	0.918	1.089
Working capital	-0.016	-0.59	0.555	0.134	7.485
AEM FTSE SMALL CAPS –VE	B		P	Tolerance	VIF
(Constant)	-0.122	-8.178	0.000		
ABNORMAL PRODUCTION	0.005	0.209	0.834	0.640	1.563
ABNORMAL CASH FLOWS	0.1	1.676	0.094	0.704	1.421
ABNORMAL DISCRETIONARY EXPENSES	-0.103	-4.24	0.000	0.720	1.390
Time	0.003	2.508	0.012	0.816	1.225
Financial crisis	0.032	2.089	0.037	0.811	1.233
Change in GDP	0.004	1.679	0.094	0.913	1.095
Return in equity	0.003	1.406	0.160	0.808	1.238
Net operating assets	-1.20E-08	-0.594	0.552	0.922	1.084
Operating cycle	1.45E-06	0.133	0.894	0.564	1.774
Debt ratio	-2.31E-08	-0.013	0.990	0.986	1.014
Debt to EBITDA	8.99E-05	0.114	0.909	0.981	1.020
Debt to Equity	-0.001	-1.126	0.261	0.821	1.219
Quick ratio	-0.028	-1.452	0.147	0.096	10.389
Times interest earned	-2.11E-05	-0.791	0.429	0.916	1.092
Working capital	0.037	2.215	0.027	0.108	9.225

Dependent Variable: DISCRETIONARY ACCRUALS

APPENDIX XCIX- FTSE 100 COLLINEARITY for REM and VIF for Positive Residuals

	REM Combined FTSE 100 +VE					
	ABNORMAL CASH FLOWS	B	T	p-value	Tolerance	VIF
Cash Flow	(Constant)	0.017	2.262	0.024		
	D. ACCRUALS	0.004	5.918	0.000	0.872	1.146
	A. PRODUCTION	-0.157	-9.934	0.000	0.639	1.565
	A. D. EXPENSES	-0.076	-5.175	0.000	0.718	1.393
	Time	-0.001	-1.811	0.071	0.821	1.218
	Financial crisis	0.013	1.865	0.063	0.770	1.298
	Change in GDP	-0.002	-1.5	0.134	0.917	1.091
	Return in equity	0.002	0.776	0.438	0.122	8.172
	Risk of bankruptcy	0.008	2.437	0.015	0.040	25.073
	Tax rate	2.32E-05	0.009	0.993	0.978	1.022
	Debt ratio	-1.17E-05	-1.973	0.049	0.041	24.501
	Debt to EBITDA	-0.001	-1.19	0.235	0.948	1.055
	Debt to Equity	0.000	-1.274	0.203	0.124	8.096
	Quick ratio	0.034	5.582	0.000	0.223	4.484
	Times interest earned	9.47E-07	1.538	0.125	0.944	1.059
	Working capital	-0.007	-1.375	0.170	0.211	4.748
D. ACCRUALS	A. D. EXPENSES	B	T	p-value	Tolerance	VIF
	(Constant)	0.068	2.188	0.030		
	D. ACCRUALS	-0.043	-1.831	0.069	0.135	7.399
	A. CASH FLOWS	1.095	9.97	0.000	0.861	1.161
	A. PRODUCTION	-0.421	-14.74	0.000	0.812	1.231
	Time	0.002	1.173	0.242	0.684	1.461
	Financial crisis	0.034	1.297	0.196	0.514	1.945
	Change in GDP	0.001	0.477	0.634	0.900	1.111
	Return in equity	0.017	0.867	0.387	0.015	68.118
	Risk of bankruptcy	0.024	2.219	0.028	0.640	1.562
	Tax rate	-0.004	-0.467	0.641	0.966	1.035
	Debt ratio	0.000	-1.496	0.136	0.285	3.51
	Debt to EBITDA	-0.001	-0.542	0.589	0.809	1.237
	Debt to Equity	-0.003	-0.932	0.352	0.015	67.839
	Quick ratio	0.130	3.447	0.001	0.137	7.311
	Times interest earned	-5.70E-06	-1.455	0.147	0.122	8.21
	Working capital	-0.097	-3.092	0.002	0.160	6.237
A. PRODUCTION	A. PRODUCTION	B	t	p-value	Tolerance	VIF
	(Constant)	0.094	8.39	0.000		
	D. ACCRUALS	0.036	3.38	0.001	0.686	1.458
	A. CASH FLOWS	-0.864	-12.39	0.000	0.886	1.129
	A.D. EXPENSES	-0.43	-6.89	0.000	0.956	1.046
	Time	-0.001	-0.975	0.330	0.837	1.194
	Financial crisis	0.030	2.446	0.015	0.621	1.611
	Change in GDP	0.001	0.48	0.632	0.889	1.125
	Return in equity	-0.006	-0.74	0.460	0.729	1.371
	Risk of bankruptcy	0.005	2.359	0.019	0.095	10.554
	Tax rate	-0.002	-0.414	0.679	0.972	1.029
	Debt ratio	-7.35E-06	-1.944	0.053	0.100	9.978
	Debt to EBITDA	0.000	-0.434	0.664	0.910	1.099
	Debt to Equity	0.000	-0.177	0.859	0.759	1.317
	Quick ratio	-0.036	-4.155	0.000	0.607	1.648
	Times interest earned	0.000	0.54	0.590	0.686	1.457
	Working capital	0.017	2.729	0.007	0.593	1.686

APPENDIC C- FTSE 250 COLLINEARITY for REM and VIF for Positive Residuals

	REM Combined FTSE 250 +VE					
	ABNORMAL CASH FLOWS	B	t	p-value	Tolerance	VIF
Cash Flow	(Constant)	0.075	11.201	0.000		
	D. ACCRUALS	-0.005	-0.558	0.577	0.982	1.018
	A. PRODUCTION	-0.060	-5.561	0.000	0.831	1.204
	A. D. EXPENSES	-0.054	-3.100	0.002	0.866	1.155
	Time	-0.001	-1.483	0.138	0.805	1.242
	Financial crisis	0.004	0.536	0.592	0.813	1.230
	Change in GDP	0.002	1.234	0.218	0.925	1.081
	Return in equity	-0.001	-0.669	0.504	0.436	2.295
	Risk of bankruptcy	0.000	0.182	0.856	0.375	2.666
	Tax rate	0.004	1.279	0.201	0.886	1.128
	Debt ratio	0.000	3.462	0.001	0.760	1.316
	Debt to EBITDA	-0.001	-2.273	0.023	0.959	1.043
	Debt to Equity	0.000	0.718	0.473	0.451	2.218
	Quick ratio	0.004	0.812	0.417	0.206	4.863
	Times interest earned	0.000	0.380	0.704	0.379	2.639
	Working capital	-0.003	-0.651	0.516	0.207	4.833
	A. D. EXPENSES	B	t	p-value	Tolerance	VIF
D. ACCRUALS	(Constant)	0.151	5.958	0.000		
	D. ACCRUALS	0.202	2.026	0.043	0.947	1.056
	A. CASH FLOWS	-0.198	-6.555	0.000	0.751	1.332
	A. PRODUCTION	-0.300	-2.952	0.003	0.737	1.356
	Time	0.001	0.572	0.568	0.757	1.321
	Financial crisis	0.073	2.898	0.004	0.827	1.209
	Change in GDP	0.006	1.537	0.125	0.903	1.107
	Return in equity	0.001	0.233	0.816	0.071	14.154
	Risk of bankruptcy	-0.006	-3.088	0.002	0.205	4.888
	Tax rate	-0.005	-0.530	0.597	0.847	1.180
	Debt ratio	0.000	3.559	0.000	0.576	1.736
	Debt to EBITDA	0.000	-0.335	0.738	0.976	1.024
	Debt to Equity	0.000	-0.576	0.565	0.071	14.138
	Quick ratio	0.018	0.650	0.516	0.194	5.147
	Times interest earned	0.000	1.847	0.065	0.225	4.446
	Working capital	-0.003	-0.146	0.884	0.204	4.909
	A. PRODUCTION	B	t	p-value	Tolerance	VIF
A. PRODUCTION	(Constant)	-0.127	-3.311	0.001		
	D. ACCRUALS	0.135	0.972	0.332	0.829	1.206
	A. CASH FLOWS	-1.195	-8.583	0.000	0.756	1.323
	A.D. EXPENSES	-0.243	-1.931	0.054	0.927	1.079
	Time	0.032	10.594	0.000	0.856	1.169
	Financial crisis	0.027	0.683	0.495	0.827	1.209
	Change in GDP	0.000	-0.006	0.995	0.914	1.094
	Return in equity	-0.019	-1.565	0.118	0.933	1.072
	Risk of bankruptcy	0.059	4.571	0.000	0.349	2.866
	Tax rate	-0.006	-0.660	0.509	0.997	1.003
	Debt ratio	0.000	-3.179	0.002	0.419	2.388
	Debt to EBITDA	-0.001	-2.103	0.036	0.938	1.066
	Debt to Equity	0.005	1.731	0.084	0.912	1.096
	Quick ratio	0.022	1.196	0.232	0.490	2.042
	Times interest earned	0.000	0.847	0.397	0.907	1.102
	Working capital	-0.036	-2.420	0.016	0.456	2.191

APPENDIX CI- FTSE Small Cap COLLINEARITY for REM and VIF for Positive Residuals

	REM Combined FTSE SMALL CAPS +VE					
	ABNORMAL CASH FLOWS	B	t	p-value	Tolerance	VIF
Cash Flow	(Constant)	0.051	6.176	0.000		
	D. ACCRUALS	-0.169	-4.486	0.000	0.951	1.052
	A. PRODUCTION	-0.080	-6.614	0.000	0.767	1.304
	A. D. EXPENSES	0.007	0.524	0.600	0.755	1.324
	Time	-0.001	-0.863	0.388	0.866	1.155
	Financial crisis	0.005	0.518	0.605	0.845	1.183
	Change in GDP	-0.002	-1.116	0.265	0.926	1.079
	Return in equity	0.008	1.340	0.181	0.135	7.422
	Risk of bankruptcy	0.000	1.827	0.068	0.131	7.648
	Tax rate	0.005	1.167	0.244	0.969	1.032
	Debt ratio	0.000	-1.604	0.110	0.131	7.634
	Debt to EBITDA	0.000	0.785	0.433	0.857	1.167
	Debt to Equity	-0.001	-1.084	0.279	0.137	7.302
	Quick ratio	0.028	2.794	0.005	0.118	8.502
	Times interest earned	0.000	1.942	0.053	0.957	1.045
	Working capital	-0.014	-1.574	0.116	0.116	8.614
	A. D. EXPENSES	B	t	p-value	Tolerance	VIF
D. ACCRUALS	(Constant)	0.155	5.245	0.000		
	D. ACCRUALS	0.095	0.818	0.414	0.772	1.296
	A. CASH FLOWS	-1.062	-22.245	0.000	0.790	1.266
	A. PRODUCTION	-1.081	-9.763	0.000	0.691	1.447
	Time	0.003	1.062	0.289	0.811	1.232
	Financial crisis	0.000	0.008	0.994	0.821	1.218
	Change in GDP	-0.002	-0.398	0.691	0.919	1.088
	Return in equity	-0.001	-0.035	0.972	0.704	1.421
	Risk of bankruptcy	0.000	0.470	0.639	0.733	1.365
	Tax rate	-0.002	-0.427	0.670	0.975	1.026
	Debt ratio	0.000	-0.593	0.554	0.801	1.248
	Debt to EBITDA	-0.001	-1.022	0.307	0.941	1.063
	Debt to Equity	-0.005	-0.553	0.581	0.743	1.346
	Quick ratio	0.085	2.601	0.010	0.102	9.762
	Times interest earned	0.000	1.925	0.055	0.810	1.235
	Working capital	-0.045	-1.516	0.131	0.105	9.484
	A. PRODUCTION	B	t	p-value	Tolerance	VIF
A. PRODUCTION	(Constant)	0.125	5.930	0.000		
	D. ACCRUALS	0.069	1.011	0.312	0.941	1.063
	A. CASH FLOWS	-0.637	-7.668	0.000	0.903	1.107
	A.D. EXPENSES	-0.566	-11.615	0.000	0.824	1.213
	Time	0.000	-0.163	0.871	0.771	1.297
	Financial crisis	-0.020	-1.080	0.281	0.804	1.244
	Change in GDP	0.000	0.099	0.921	0.915	1.092
	Return in equity	-0.003	-0.605	0.546	0.534	1.873
	Risk of bankruptcy	0.001	1.668	0.096	0.024	42.509
	Tax rate	-0.001	-0.323	0.747	0.994	1.006
	Debt ratio	0.000	-1.495	0.136	0.023	42.635
	Debt to EBITDA	-0.001	-2.161	0.031	0.934	1.071
	Debt to Equity	0.002	1.454	0.147	0.536	1.865
	Quick ratio	-0.012	-0.642	0.521	0.317	3.152
	Times interest earned	0.000	0.796	0.426	0.977	1.024
	Working capital	0.007	0.441	0.660	0.305	3.274

APPENDIX CII- FTSE 100 COLLINEARITY for REM and VIF for Negative Residuals

	REM combined FTSE 100 –VE					
	ABNORMAL CASH FLOWS	B	t	p-value	Tolerance	VIF
Cash Flow	(Constant)	-0.036	-5.697	0.000		
	D. ACCRUALS	0.008	1.406	0.161	0.630	1.587
	A. PRODUCTION	0.061	11.111	0.000	0.740	1.351
	A. D. EXPENSES	0.064	3.479	0.001	0.972	1.028
	Time	0.002	3.862	0.000	0.757	1.321
	Financial crisis	-0.002	-0.251	0.802	0.566	1.767
	Change in GDP	0.000	-0.117	0.907	0.876	1.142
	Return in equity	-0.005	-1.192	0.234	0.650	1.539
	Risk of bankruptcy	-0.004	-3.844	0.000	0.146	6.848
	Tax rate	-0.005	-1.072	0.285	0.967	1.034
	Debt ratio	0.000	3.409	0.001	0.153	6.547
	Debt to EBITDA	0.000	0.612	0.541	0.950	1.052
	Debt to Equity	-0.001	-0.890	0.374	0.716	1.396
	Quick ratio	0.001	0.290	0.772	0.507	1.972
	Times interest earned	0.000	-0.916	0.360	0.755	1.325
	Working capital	-0.011	-2.827	0.005	0.500	1.999
	A. D. EXPENSES	B	t	p-value	Tolerance	VIF
D. ACCRUALS	(Constant)	-0.069	-20.855	0.000		
	D. ACCRUALS	0.000	-0.673	0.501	0.922	1.085
	A. CASH FLOWS	-0.009	-0.576	0.565	0.838	1.193
	A. PRODUCTION	0.008	2.296	0.022	0.849	1.177
	Time	0.002	7.892	0.000	0.808	1.238
	Financial crisis	-0.005	-1.486	0.138	0.783	1.276
	Change in GDP	0.000	-0.210	0.833	0.915	1.092
	Return in equity	-0.001	-1.038	0.300	0.261	3.831
	Risk of bankruptcy	-0.005	-6.434	0.000	0.107	9.370
	Tax rate	-0.003	-1.705	0.089	0.977	1.023
	Debt ratio	0.000	6.015	0.000	0.110	9.119
	Debt to EBITDA	0.000	-1.255	0.210	0.974	1.026
	Debt to Equity	0.000	0.834	0.405	0.262	3.823
	Quick ratio	0.000	0.086	0.932	0.376	2.657
	Times interest earned	0.000	1.503	0.133	0.879	1.138
	Working capital	0.002	0.921	0.357	0.365	2.737
	A. PRODUCTION	B	t	p-value	Tolerance	VIF
A. PRODUCTION	(Constant)	-0.177	-3.673	0.000		
	D. ACCRUALS	-0.024	-6.109	0.000	0.910	1.099
	A. CASH FLOWS	1.901	12.019	0.000	0.781	1.281
	A.D. EXPENSES	-0.106	-1.483	0.139	0.973	1.028
	Time	0.018	5.150	0.000	0.766	1.305
	Financial crisis	0.117	2.708	0.007	0.772	1.295
	Change in GDP	0.011	1.722	0.086	0.914	1.094
	Return in equity	-0.017	-1.332	0.184	0.123	8.137
	Risk of bankruptcy	-0.146	-7.473	0.000	0.298	3.356
	Tax rate	-0.071	-1.797	0.073	0.968	1.033
	Debt ratio	0.000	6.043	0.000	0.375	2.669
	Debt to EBITDA	-0.001	-0.540	0.589	0.976	1.025
	Debt to Equity	0.003	1.542	0.124	0.124	8.040
	Quick ratio	-0.100	-2.162	0.031	0.137	7.273
	Times interest earned	0.000	-1.502	0.134	0.943	1.060
	Working capital	0.101	2.376	0.018	0.126	7.958

Cash Flow

APPENDIX CIII- FTSE 250 COLLINEARITY for REM and VIF for Negative Residuals

REM combined FTSE 250 –VE

	ABNORMAL CASH FLOWS	B	t	p-value	Tolerance	VIF
	(Constant)	-0.040	-5.157	0.000		
	D. ACCRUALS	-0.205	-7.479	0.000	0.971	1.030
	A. PRODUCTION	-0.048	-7.632	0.000	0.887	1.128
	A. D. EXPENSES	0.035	1.846	0.065	0.939	1.065
	Time	-0.003	-4.053	0.000	0.819	1.222
	Financial crisis	-0.005	-0.548	0.584	0.819	1.222
	Change in GDP	0.001	0.793	0.428	0.920	1.087
	Return in equity	-0.002	-0.951	0.342	0.055	18.025
	Risk of bankruptcy	-0.010	-6.109	0.000	0.341	2.933
	Tax rate	0.000	-0.196	0.844	0.985	1.015
	Debt ratio	0.000	4.144	0.000	0.351	2.850
	Debt to EBITDA	0.000	1.202	0.230	0.952	1.051
	Debt to Equity	0.000	0.899	0.369	0.055	18.052
	Quick ratio	0.010	3.085	0.002	0.955	1.047
	Times interest earned	0.000	2.111	0.035	0.782	1.279
	Working capital	-0.011	-2.827	0.005	0.500	1.999
	A. D. EXPENSES	B	t	p-value	Tolerance	VIF
	(Constant)	-0.086	-17.830	0.000		
	D. ACCRUALS	0.005	0.694	0.488	0.970	1.031
	A. CASH FLOWS	-0.009	-1.952	0.051	0.795	1.258
	A. PRODUCTION	0.079	4.752	0.000	0.823	1.215
	Time	0.002	3.496	0.000	0.809	1.236
	Financial crisis	-0.028	-5.054	0.000	0.827	1.209
	Change in GDP	-0.004	-4.053	0.000	0.921	1.086
D.Expenses	Return in equity	-0.003	-1.431	0.153	0.515	1.943
	Risk of bankruptcy	-0.004	-4.842	0.000	0.490	2.041
	Tax rate	-0.002	-1.543	0.123	0.987	1.013
	Debt ratio	0.000	1.532	0.126	0.484	2.064
	Debt to EBITDA	0.000	0.715	0.475	0.987	1.013
	Debt to Equity	0.001	1.670	0.095	0.519	1.927
	Quick ratio	-0.004	-1.519	0.129	0.466	2.144
	Times interest earned	0.000	1.557	0.120	0.773	1.293
	Working capital	0.011	4.997	0.000	0.472	2.118
	A. PRODUCTION	B	t	p-value	Tolerance	VIF
	(Constant)	-0.177	-3.673	0.000		
	D. ACCRUALS	-0.024	-6.109	0.000	0.910	1.099
	A. CASH FLOWS	1.901	12.019	0.000	0.781	1.281
	A.D. EXPENSES	-0.106	-1.483	0.139	0.973	1.028
	Time	0.018	5.150	0.000	0.766	1.305
A. PRODUCTION	Financial crisis	0.117	2.708	0.007	0.772	1.295
	Change in GDP	0.011	1.722	0.086	0.914	1.094
	Return in equity	-0.017	-1.332	0.184	0.123	8.137
	Risk of bankruptcy	-0.146	-7.473	0.000	0.298	3.356
	Tax rate	-0.071	-1.797	0.073	0.968	1.033
	Debt ratio	0.000	6.043	0.000	0.375	2.669
	Debt to EBITDA	-0.001	-0.540	0.589	0.976	1.025
	Debt to Equity	0.003	1.542	0.124	0.124	8.040

	Quick ratio	-0.100	-2.162	0.031	0.137	7.273
	Times interest earned	0.000	-1.502	0.134	0.943	1.060
	Working capital	0.101	2.376	0.018	0.126	7.958

APPENDIX CIV- FTSE Small Cap COLLINEARITY for REM and VIF for Negative Residuals

	REM combined FTSE SMALL CAPS –VE					
	ABNORMAL CASH FLOWS	B	t	p-value	Tolerance	VIF
	(Constant)	-0.072	-8.591	0.000		
	D. ACCRUALS	-0.103	-3.684	0.000	0.925	1.081
	A. PRODUCTION	-0.061	-5.872	0.000	0.795	1.257
	A. D. EXPENSES	-0.051	-4.826	0.000	0.757	1.321
	Time	0.002	2.825	0.005	0.781	1.281
	Financial crisis	0.010	1.254	0.211	0.753	1.327
Cash Flow	Change in GDP	0.002	1.262	0.208	0.882	1.134
	Return in equity	0.001	0.661	0.509	0.780	1.283
	Risk of bankruptcy	0.000	-0.750	0.454	0.822	1.217
	Tax rate	0.000	-0.046	0.963	0.988	1.012
	Debt ratio	0.000	1.171	0.242	0.852	1.173
	Debt to EBITDA	0.000	-0.058	0.954	0.980	1.020
	Debt to Equity	0.000	-0.646	0.518	0.789	1.268
	Quick ratio	-0.009	-1.134	0.257	0.275	3.637
	Times interest earned	0.000	1.736	0.083	0.935	1.070
	Working capital	0.008	1.214	0.225	0.280	3.572
	A. D. EXPENSES	B	t	p-value	Tolerance	VIF
	(Constant)	-0.233	-30.386	0.000		
	D. ACCRUALS	-0.057	-1.775	0.076	0.931	1.075
	A. CASH FLOWS	-0.025	-2.583	0.010	0.835	1.198
	A. PRODUCTION	0.178	4.953	0.000	0.790	1.266
	Time	0.012	16.227	0.000	0.827	1.210
	Financial crisis	0.030	3.564	0.000	0.812	1.232
	Change in GDP	0.002	1.545	0.123	0.918	1.090
D. Expenses	Return in equity	-0.002	-0.713	0.476	0.451	2.218
	Risk of bankruptcy	-0.001	-6.912	0.000	0.145	6.885
	Tax rate	0.003	1.064	0.288	0.992	1.008
	Debt ratio	0.000	6.301	0.000	0.146	6.870
	Debt to EBITDA	0.000	0.237	0.813	0.965	1.036
	Debt to Equity	0.000	0.064	0.949	0.454	2.204
	Quick ratio	0.014	1.756	0.080	0.250	4.001
	Times interest earned	0.000	0.391	0.696	0.972	1.029
	Working capital	-0.005	-0.692	0.490	0.248	4.026
	A. PRODUCTION	B	t	p-value	Tolerance	VIF
	(Constant)	-0.201	-6.774	0.000		
	D. ACCRUALS	-0.303	-2.352	0.019	0.884	1.132
	A. CASH FLOWS	-0.550	-6.668	0.000	0.848	1.180
	A.D. EXPENSES	-0.102	-3.154	0.002	0.885	1.130
A. PRODUCTION	Time	0.000	0.064	0.949	0.826	1.211
	Financial crisis	-0.036	-1.161	0.246	0.804	1.243
	Change in GDP	0.003	0.483	0.629	0.914	1.094
	Return in equity	-0.026	-1.428	0.154	0.327	3.056
	Risk of bankruptcy	-0.003	-2.616	0.009	0.882	1.134
	Tax rate	-0.016	-1.331	0.184	0.980	1.021
	Debt ratio	0.000	0.072	0.942	0.980	1.021

Debt to EBITDA	0.000	-0.149	0.882	0.975	1.026
Debt to Equity	0.003	0.785	0.433	0.335	2.988
Quick ratio	0.132	3.916	0.000	0.087	11.469
Times interest earned	0.000	-0.381	0.703	0.905	1.105
Working capital	-0.093	-3.064	0.002	0.088	11.305

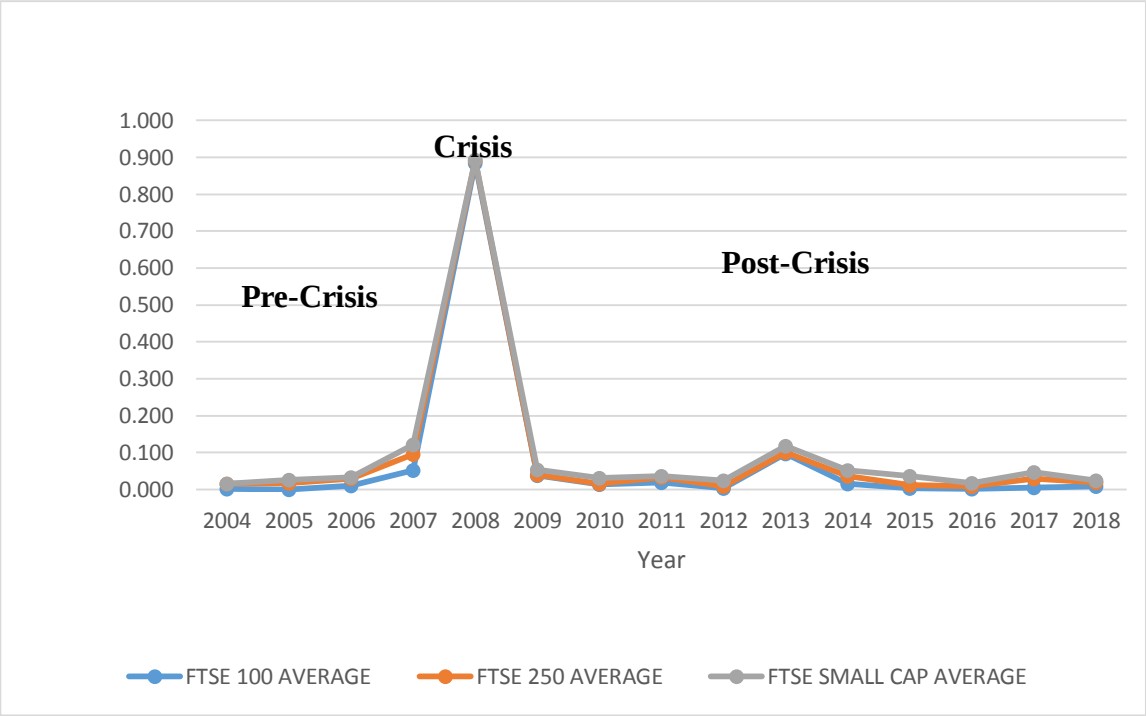
APPENDIX CV- AEM LEAST SQUARES REGRESSIONS for Negative Residuals

Kothari -VE AEM		B	t	p-value	Model	ANOVA
	(Constant)	-0.096	-9.840	0.000		
	Operating cycle	0.000	-0.412	0.681		
	Net Operating Cycle	0.000	0.754	0.451		
	CHANGE IN GDP	0.001	0.525	0.600		
	ROE	0.000	0.788	0.431		
	Time	0.004	3.882	0.000		
	Financial crisis	0.022	2.044	0.041		
	Debt Ratio	0.000	-1.282	0.200		
	Debt to EBITDA	0.000	0.532	0.595		
FTSE	Debt to Equity	-0.001	-0.894	0.371	R=0.192,	F (11, 595)
SMALL	Interest cover	0.000	-0.115	0.909	R^2=0.037, Adj	=2.041,
CAPS	Quick ratio	0.002	0.397	0.691	R^2=-0.019	p=0.023
	(Constant)	-0.056	-11.914	0.000		
	Operating cycle	0.000	-0.730	0.466		
	Net Operating Cycle	0.000	0.720	0.472		
	CHANGE IN GDP	0.006	8.118	0.000		
	ROE	0.000	-0.271	0.786		
	Time	0.001	2.469	0.014		
	Financial crisis	-0.001	-0.111	0.911		
	Debt Ratio	0.000	-2.065	0.039		
	Debt to EBITDA	0.000	-0.443	0.658		
	Debt to Equity	0.000	0.169	0.866	R=0.286,	F (11, 971)
	Interest cover	0.000	1.725	0.085	R^2=0.082, Adj	=7.84,
FTSE 250	Quick ratio	0.002	0.695	0.487	R^2=-0.071	p=0.000
	(Constant)	0.073	0.883	0.378		
	Operating cycle	0.000	-0.472	0.637		
	Net Operating Cycle	0.000	0.288	0.774		
	CHANGE IN GDP	0.024	1.641	0.102		
	ROE	-0.007	-2.123	0.034		
	Time	-0.003	-0.398	0.691		
	Financial crisis	-0.543	-5.595	0.000		
	Debt Ratio	0.000	-0.007	0.994		
	Debt to EBITDA	0.001	0.445	0.657		
	Debt to Equity	0.014	2.399	0.017	R=0.337,	F (11, 422)
	Interest cover	0.000	-0.043	0.965	R^2=0.114, Adj	=4.928,
FTSE 100	Quick ratio	-0.095	-1.775	0.077	R^2=0.091	P=0.000

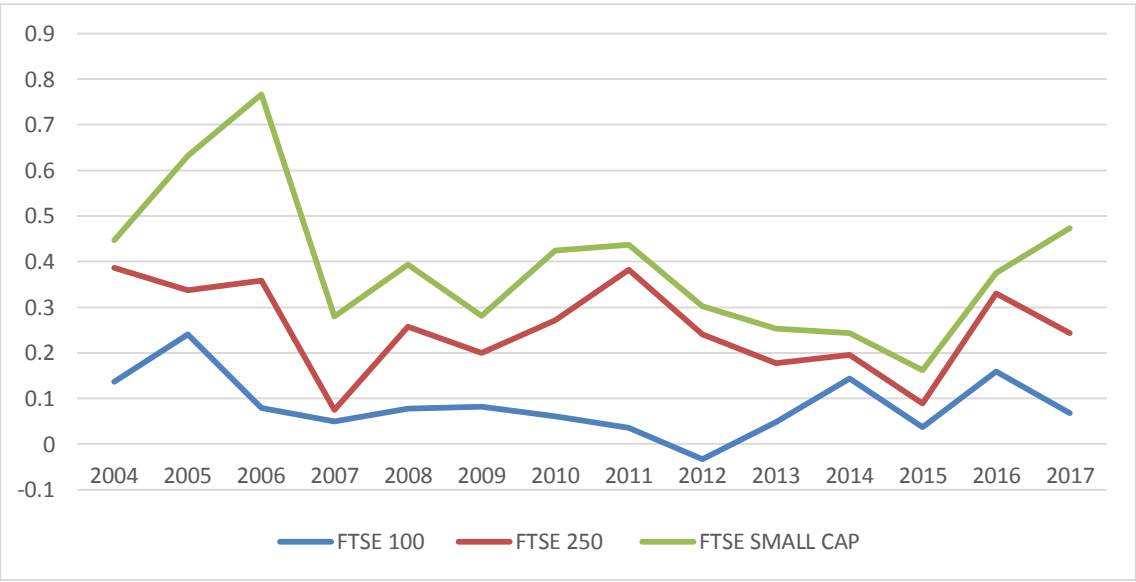
APPENDIX CVI- AEM LEAST SQUARES REGRESSIONS for Positive Residuals

Kothari +VE AEM		B	t	p-value	Model	ANOVA
	(Constant)	0.083	10.651	0.000		
	Operating cycle	0.000	1.180	0.238		
	Net Operating Cycle	0.000	3.313	0.001		
	CHANGE IN GDP	-0.003	-2.475	0.014		
	ROE	0.000	1.816	0.070		
	Time	-0.003	-3.740	0.000		
	Financial crisis	-0.015	-1.548	0.122		
	Debt Ratio	0.000	-0.836	0.403		
	Debt to EBITDA	0.001	9.834	0.000	R=0.445,	
	Debt to Equity	-0.001	-0.650	0.516	R^2=0.198,	F (11, 559)
FTS SMALL	Interest cover	0.000	1.550	0.122	Adj	=12.533,
CAPS	Quick ratio	-0.001	-0.361	0.718	R^2=0.182	p=0.000
	(Constant)	0.072	10.547	0.000		
	Operating cycle	0.000	-1.629	0.104		
	Net Operating Cycle	0.000	0.231	0.817		
	CHANGE IN GDP	0.000	-0.336	0.737		
	ROE	0.000	-0.444	0.658		
	Time	-0.001	-2.082	0.038		
	Financial crisis	0.015	1.660	0.097		
	Debt Ratio	0.000	0.343	0.732		
	Debt to EBITDA	0.000	1.047	0.295		
	Debt to Equity	0.000	0.290	0.772	R=0.144,	F (11, 753)
	Interest cover	0.000	0.438	0.661	R^2=0.21, Adj	=1446,
FTS250	Quick ratio	-0.002	-0.893	0.372	R^2=0.006	p=0.147
	(Constant)	0.104	2.580	0.010		
	Operating cycle	0.000	0.498	0.619		
	Net Operating Cycle	0.000	-0.387	0.699		
	CHANGE IN GDP	-0.009	-1.168	0.243		
	ROE	0.003	0.807	0.420		
	Time	0.002	0.456	0.649		
	Financial crisis	0.590	12.748	0.000		
	Debt Ratio	0.000	-0.053	0.958		
	Debt to EBITDA	-0.005	-1.110	0.268	R=0.593,	
	Debt to Equity	-0.005	-0.968	0.334	R^2=0.352,	F (11, 419)
	Interest cover	0.000	0.082	0.934	Adj	=20.241,
FTS100	Quick ratio	-0.040	-1.809	0.071	R^2=0.335	p=0.000

APPENDIX CVII-KOTHARI ET AL (2006) FOR THE DIFFERENCE OF THE POSITIVE AND NEGATIVE ABSOLUTE DISCRETIONARY ACCRUALS



APPENDIX CVIII- McNichols (2002) FOR THE DIFFERENCE OF THE POSITIVE AND NEGATIVE ABSOLUTE DISCRETIONARY ACCRUALS



APPENDIX CIX- AEM LEAST SQUARES REGRESSIONS for Positive Residuals

	McNichols +VE AEM	B	T	p-value	Model	ANOMA
	(Constant)	0.326	6.162	0.000		
	Operating cycle	0.000	1.287	0.199		
	Net Operating Cycle	0.000	-3.695	0.000		
	Change in GDP	0.012	1.281	0.201		
	ROE	0.001	0.312	0.755		
	Time	-0.013	-2.329	0.021		
	Financial crisis	0.033	0.528	0.598		
	Debt Ratio	0.000	1.470	0.143		
	Debt to EBITDA	0.002	0.625	0.532		
	Debt to Equity	-0.002	-0.169	0.866	R=0.350,	F (11, 266)
SMALL	Interest cover	0.000	-1.280	0.202	R^2=0.123, Adj	=3.385,
CAPS	Quick ratio	0.061	2.206	0.028	R^2=0.087	P=0.000
	(Constant)	0.210	5.508	0.000		
	Operating cycle	0.000	-0.425	0.671		
	Net Operating Cycle	0.000	-4.177	0.000		
	Change in GDP	0.000	-0.024	0.981		
	ROE	0.000	-0.100	0.920		
	Time	0.013	3.169	0.002		
	Financial crisis	-0.016	-0.368	0.713		
	Debt Ratio	0.000	2.251	0.025		
	Debt to EBITDA	0.000	0.316	0.752		
	Debt to Equity	-0.001	-0.411	0.681	R=0.256,	F (11, 479)
	Interest cover	0.000	-0.139	0.890	R^2=0.065, Adj	=3.048,
FTS 250	Quick ratio	0.022	1.381	0.168	R^2=0.044	p=0.001
	(Constant)	0.197	3.387	0.001		
	Operating cycle	0.000	0.244	0.807		
	Net Operating Cycle	0.000	-2.311	0.022		
	Change in GDP	0.000	0.022	0.982		
	ROE	0.001	0.424	0.672		
	Time	-0.009	-1.498	0.135		
	Financial crisis	-0.002	-0.038	0.970		
	Debt Ratio	0.000	-0.428	0.669		
	Debt to EBITDA	0.017	1.904	0.058		
	Debt to Equity	-0.004	-0.540	0.590	R=0.267,	F (11, 268)
	Interest cover	0.000	-0.238	0.812	R^2=071, Adj	=1.869,
FTS100	Quick ratio	0.076	2.656	0.008	R^2=0.033	p=0.043

APPENDIX CX- AEM LEAST SQUARES REGRESSIONS for Negative Residuals

McNichols -VE AEM		B	t	p-value	Model	ANOVA
	(Constant)	-0.272	-13.548	0.000		
	Operating cycle	0.000	-1.328	0.185		
	Net Operating Cycle	0.000	1.225	0.221		
	CHANGE IN GDP	-0.002	-0.628	0.530		
	ROE	0.000	-0.022	0.983		
	Time	0.011	5.018	0.000		
	Financial crisis	0.027	1.230	0.219		
	Debt Ratio	0.000	0.964	0.336		
	Debt to EBITDA	0.001	0.573	0.567		
	Debt to Equity	0.004	1.093	0.275	R=0.255,	F (11, 514)
FTS SMALL	Interest cover	0.000	-0.198	0.843	R^2=0.065, Adj	=3.237,
CAPS	Quick ratio	-0.002	-0.252	0.801	R^2 =0.045	p=0.000
	(Constant)	-0.157	-6.310	0.000		
	Operating cycle	0.000	-0.091	0.928		
	Net Operating Cycle	0.000	-1.058	0.290		
	CHANGE IN GDP	0.004	1.005	0.315		
	ROE	0.000	-1.271	0.204		
	Time	-0.017	-6.856	0.000		
	Financial crisis	-0.049	-1.775	0.076		
	Debt Ratio	0.000	-0.303	0.762		
	Debt to EBITDA	0.000	-0.366	0.714		
	Debt to Equity	0.001	1.217	0.224		
	Quick ratio	0.061	3.628	0.000	R=0.282,	F (12, 914)
	Times interest earned	0.000	-0.109	0.913	R^2=0.08, Adj	=6.599,
FTS 250	Working capital	-0.039	-3.584	0.000	R^2=0.068	p=0.000
	(Constant)	-0.195	-13.699	0.000		
	Operating cycle	0.000	0.481	0.631		
	Net Operating assets	0.000	3.445	0.001		
	CHANGE IN GDP	0.000	-0.008	0.994		
	ROE	-0.002	-1.295	0.196		
	Time	0.005	3.773	0.000		
	Financial crisis	-0.015	-0.987	0.324		
	Debt Ratio	0.000	-0.534	0.594		
	Debt to EBITDA	-0.001	-0.701	0.484		
	Debt to Equity	0.002	1.095	0.274	R=0.304,	F (11, 417)
	Interest cover	0.000	-0.288	0.774	R^2=0.093, Adj	=3.873,
FTS100	Quick ratio	0.018	1.424	0.155	R^2=0.069	0.000