The Relation between Innovation and Earnings Management: Evidence for the UK

ABSTRACT

The purpose of this paper is to investigate whether the executives of innovative firms in the UK economy prefer to support innovation over earnings. This study uses discretionary accruals and abnormal activities as proxies for earnings management and research and development as a proxy for innovation. This study finds dissimilar results for the discretionary accrual and abnormal activity models, it conducts additional analysis that accounts for the innovation to beat the earnings group, and refers to this group as the "downward" group; another analysis accounts for the innovation to reduce earnings, and refers to this group as the "upward" group. The results suggest that there is a negative association between discretionary accruals and downward innovation and finds a similar relationship in abnormal activities and the downward group, which indicates the referential value of beating earnings over innovation. Moreover, there is a positive relationship in increased innovation, which suggests that executives prefer to support innovation when earnings are achieved or unachievable. This study also documented that innovative firms engage more in manipulation than non-innovative firms and shows that understanding executives' incentives to earn income provides better evidence on the relationship between innovation and earnings. This is the first paper that adds to the understanding of innovation by measuring using upwards and downwards incentives.

Keywords: *Innovation; Real and Accruals Earnings Management; Incentives; Manipulation.*

1. INTRODUCTION

Innovation is considered one of the most central ways to provide firms the techniques to increase shareholders' wealth and growth. Therefore, engaging in innovations might lead to new income, improve efficiency, and increase operational productivity, hence growing a firm's revenue. With enhancement of productivity, innovations could increase the predictable revenues on equity shares (Zhu, 2021).

Several challenges around the world make innovation more important than ever (i.e. COVID-19 and the 2008 financial crisis). These pandemics have left many firms wondering if they can meet the challenges. Some were able to do so and deliver complex services to their consumers (Heinonen and Strandvik, 2020) and were able to enhance their services using innovation. This paper is motivated to investigate the manipulation of the innovation strategy in economies that adopt different strategies. Our paper reviews the innovation strategy measurement in the recent literature and discusses the difficulty of interpreting the results without understanding the innovation incentives and manipulation.

Our study discusses the trade-offs associated with the innovation and earnings management literature — including those based on increased innovation and those based on downward innovations. Given the limited theory, this study divides innovation into increased and downward innovation, and the task of identifying how innovations are divided needs to be addressed. Although prior literature made essential contributions to innovation manipulation at the time they were introduced and had significant impacts, this study recommends that further studies on understanding the incentives of innovations and manipulation are needed. One way that innovation is believed to play a significant role in firms is investing in innovations as it is vital to remain competitive and control the market. This idea of investing in innovation is among the most promising methods. However, the unpredictability and uncertainty of innovation's future economic benefits are also likely to influence executives' decisions on whether to invest or not. Other factors influence the imperfect decision to invest in innovation and include the cost of innovation, primarily when innovation projects are entirely written off in cases that are unviable or abandoned (Damodaran, 1999), the risk of innovations (Kor, 2006), the fear of failure of outcomes of innovation such as lawsuits and tax consequences (Cherensky, 1994), and the appearance of innovation projects that might discourage executives from delivering the funds (Jeppson, 2013)

This study conducts its investigation by dividing innovations into two groups: increased incentives, where executives prefer to increase innovation expenditures, and downward innovations, where executives decrease innovations to meet earnings. This study argues that the executives in each group behave differently, even if their main objectives are to innovate. This study considers that the increase in innovations in the firms was linked with a contemporaneous increase in earnings above the needed level or a decrease in earnings where it is hard to meet the needed level. However, this study also considers that the decrease in innovation to be associated with meeting earnings. Nevertheless, in this category, executives in innovation firms face the ultimate question of whether to invest in innovation. On the one hand, innovations provide an advantage in the market and future economic benefits, while, on the other, earnings provide stability in the market and higher market value.

Following the prior literature, this study utilises earnings management models to find a relationship with innovation. This study examined the modified Jones as it is the most efficient model to estimate earnings management (Peasnell, Pope and Young, 2000). Next, it included a real activities model since executives change their operating policies to achieve the requirements to obtain their incentives (Graham, Harvey and Rajgopal, 2005). Also, this study went a step further to include standard Jones and one of the adjusted standard Jones models, which is the Kothari model, to uncover whether a firm's performance can impact the residuals, which will impact the innovation relationship.

In our first analysis, this study uses an OLS regression to test whether the discretionary accruals associated with reducing innovation meet earnings or support innovation after beating the expected profits. This study conducts similar analyses for real activities based on models that decrease the cash flow.

This study finds significant negative relationship associations between discretionary accrual and innovation and between real activities and innovations in downward incentives. However, the results suggest that those with downward innovation incentives are motivated to beat expected profits. Regarding increase incentives, in real activities, the results suggest that this negative relationship indicates that the more that executives accelerate abnormal activities, the less available they are for innovation. Which is consistent with the initial idea of Jeppson (2013), that there is a negative relationship between real activities and innovations. In discretionary accruals, our finding is not consistent with Hao and Li's (2016) belief that there is a positive relationship between discretionary accruals and innovation.

The main aim of establishing this study is to answer the following questions: what is the relationship between innovation and real earnings management? What is the relationship between innovation and accruals earnings management? Do the firms that do not have innovation have earnings management, whether real or accruals? This paper contributes to the existing literature as, to the best of our knowledge, it is the first to add to the understanding of innovations by measuring innovation using increased and downward incentives. Second, understanding the executives' incentives related to earnings provides better evidence of the relationship with innovations. Third, to enhance real activity earnings management as most studies examined all abnormal activities as a proxy for innovation reduction. In contrast, this study examined abnormal cash flow and abnormal overproduction as proxies to reduce earnings. Accordingly, this study gains its importance from its contributions and implications as it draws two conclusions from abnormal activities; increase in abnormal production and abnormal sales reduces the cash flow; in addition, increase in abnormal discretionary spending increases the cash flow. Whereas, this important finding presents evidence of significant error in combining the three activities to examine innovations in prior research.

2. PRIOR RESEARCH AND HYPOTHESIS DEVELOPMENT

History offers numerous examples of firms that lost their market position and missed their opportunities while other firms did not (Bereskin *et al.*, 2018; Zhu, 2021;). This current study confidently argues that this occurs because they did not invest in innovation. This study has witnessed a competitive advantage for some firms across all industries and in every economy because their executives acknowledge the need to support innovation strategies. However,

investors acknowledge that there is uncertainty in internal innovation, specifically when the market is unable to evaluate the outcome of a project. Investors are aware of the fundamental relationship between innovations and uncertainty, especially at the beginning of a project, and that the returns are skewed (Scherer, Harhoff and Kukies, 2000). Therefore, there are significantly more investors who may avoid supporting innovation projects than investors who will support innovation projects as the potential outcomes of innovation projects are not precise. Therefore, executives turned to supporting innovation internally. To accomplish this, executives engage in earnings management. This study argues that firms that employ innovation strategies are more likely to manipulate their financial statements since firms that use this approach require a continuous injection of capital over a long period of time. This implies that organisational management in firms that use this strategy must perform proper reviews and understand the need to have suitable sources of cash available for continuous injection into innovation projects, which requires the use of discretionary accruals and real activity to provide the requisite capital on a continuous basis. This, therefore, may lead executives of innovative firms to be more likely to manipulate earnings.

Prior studies have identified two methods of manipulation in firms, accrual manipulation and real activity manipulation. The flexibility of discretionary accruals and real activity allows executives to manage their firms' earnings strategically. The extant research suggests that firm executives may engage in discretionary accruals to manage reported earnings in order to benefit from new laws and regulations in the market or in an effort to reach organisational earning benchmarks and impress organisational shareholders. Consequently, they decrease innovation spending (Dechow and Sloan, 1991). Other studies provide evidence on executive initiatives to cut discretionary spending, which may include funding for innovations and marketing and advertising,, to enhance earnings (Graham, Harvey and Rajgopal, 2005; Gunny, 2010) and avoid losses (Burgstahler and Eames, 2003).

Most of the prior studies used discretionary expenditures to proxy for real activity models to document innovation manipulation. This study provides an alternative view with respect to real activity manipulation within innovation strategies. Roychowdhury (2006) stated three methods of manipulation: boosting total sales by increasing price discounts and offering credit advances to loyal clients; overproducing and decreasing the cost of the goods sold so as to increase final inventories; and taking further initiatives to cut discretionary spending, which may include funding innovations. This study argues that the three approaches have direct impacts by increasing or decreasing innovation spending. Both accelerated sales and overproduction reduce the amount of cash in firms. Consequently, this reduces innovation spending. However, the decreased discretionary expenditures increase the cash available to fund innovations.

In addition, numerous elements influence innovation strategies, such as leadership. (Capalbo *et al.*, 2018) provided evidence that executives' psychological and demographic behaviours are associated with real earnings management in innovative firms. In developed economies, executives tend to be overconfident, more experienced and educated; they take risks and invest more in risky innovative projects. In other words, executives in developed economies are expected to be destinations in the markets; a firm's executives must provide innovative products and services to customers. Furthermore, it must be first in the market to consequently achieve better earnings.

Earlier studies (Roychowdhury, 2006; Gunny, 2010; Bereskin *et al.*, 2018) favour the view that real activity manipulation is utilised to reduce innovation spending. However, the empirical support for reduction is, at best, only in abnormal discretionary expenditures. Differently, this study argues that all deviations from normal real activities should also rely on the following categories: Roychowdhury (2006) argued that overproduction, sales discounts and lenient credit terms have a negative impact on cash flow, so these kinds of activities have the effect of lowering current cash flow. In other words, overproduction is related to abnormal production manipulation as overproduction reduces fixed costs by allocating the fixed costs to units of production, thereby reducing unit costs. This reduction in the costs of goods will increase earnings, but production will also be higher than sales, and overproduction will affect the cash flow level.

Accelerating sales, which is related to an abnormal cash flow, increases earnings by increasing sales through lenient credit terms and discounts, but discount sales and adjustments to payment terms also have negative impacts on cash flows.

Furthermore, reducing other discretionary expenses, marketing and G&A sales related to abnormal discretionary expenses also increase earnings.

This study argues that examining real activity in isolation without evidence of intent raises many questions and leads to inconsistencies in results. According to our previous analysis, executives prefer to finance innovation internally rather than seeking outside financing. However, engaging in real abnormal activities will not provide additional assistance to executives due to the violated cash flow caused by abnormal production and abnormal cash flows. Instead, executives use activity manipulation to achieve targets in order to demonstrate to investors that they are meeting earnings targets and that their actions are real and actionable. As a result, the greater the real earnings management, the higher the income and lower the innovation. This study splits innovation into two categories based on innovation incentives, where it either increases innovation when earnings cannot be met or surpass earnings or decreases innovation to meet earnings.

This paper suggests that, when earnings targets can be met, innovation is no longer needed, but a need for earnings support instead, which involves more real manipulations that raised earnings; therefore, this study expected a negative relationship between real activities (abnormal production, abnormal cash flow and abnormal discretionary) with the downward innovations incentives group.

Additionally, this study suggests that executives should support innovation by spending much more on innovation than they did previously as evidence. However, increasing the real activities manipulation in production or cash flow will not provide additional cash flow to support innovation internally. Hence, the increasing innovation incentives should result in a negative relationship or no relationship. Even so, when this study looks at discretionary expenses, it expects a positive correlation since the extra cutting of expenses other than research and development allows for the promotion of innovation.

This study proposes the following hypotheses:

H1: There is a negative relationship between the innovation strategy and real activities in firms in the UK economy in decreasing (downward) innovation.

H2: There is a negative or no relationship between the innovation strategy and real activities in firms in the UK economy in increasing (increase) innovation.

H3: There is a positive relationship between the innovation strategy and real activities (discretionary expenses) in firms in the UK economy in increasing (increase) innovation.

This study tests whether discretionary accruals affect innovation decisions. Capital investment is required to achieve innovation objectives and internal innovation projects are associated with high risk since they require higher capital and do not guarantee the desired outcome. For instance, Walker (1995) indicated that, for every 100 firms investing in R&D, only one firm successfully delivers its product to the market. This study argues that, when firms internally invest in innovations, executives have more motivation to engage in manipulation due to the associated risks. Furthermore, Shust (2015) indicated that executives often increased accrual earnings by decreasing innovation expenditures, while other studies (Dechow and Sloan, 1991; Bushee, 1998) indicate no evidence of executives deciding to reduce innovation to conduct manipulation. Overall, studies have indicated that there is and is not a relationship, although different studies have indicated different signs for the relationship.

This study argues that the reason for the different findings could be due to the measurement of innovations. Prior studies have not considered executives' incentives. Executives have different incentives in terms of innovations. They may boost innovations when earnings targets are achieved and support innovation when earnings targets are impossible to achieve for the current period. The second view is to not support innovation when earnings are not accomplished.

This study argues that, whenever executives are required to meet earnings targets, they may reduce innovations; therefore, it predicts a negative relationship. However, when earnings are reached or unreasonable, executives might be comfortable engaging in accrual manipulation to increase innovation spending; therefore, a positive relationship is expected.

Formally stated, our hypotheses are as follows:

H4: There is a negative relationship between the innovation strategy and accrual-based earnings management in firms in the UK economy engaging in downward innovation.

H5: There is a positive relationship between the innovation strategy and accrual-based earnings management in firms in the UK economy engaging in increased innovation.

Prior literature on innovation and earnings management provides limited evidence on whether executives in innovative firms are more motivated to engage in earnings management (Jeppson, 2013; Hao and Li, 2016). From the understanding of the consequences of earnings management on innovations, this study argues that firms that adopt innovation strategies are more likely to engage in manipulation due to inefficient investment capital. A desire to finance innovation strategies internally over a long period of time is an essential motivation for earnings management. Presumably, these cash funds are then used to pursue innovations. This implies that the firms' executives must perform proper reviews and understand the need to have suitable sources of cash

available to continuously dedicate to innovation projects. Another factor that must be considered is the high level of adjustment costs. Whenever firms establish innovation hubs as their primary source of innovation, they require funding over a long period. If the project is abandoned at later stages, it will bring a significant adjustment cost to the firm's financial reports, which will impact the value of the firm. Furthermore, the direct implication of internally foregoing innovation support is that it is much more accessible than if it is procured through adequate external capital. This demonstrates the need for plans to ensure the continuity and reliability of the cash flows generated from operations, which places more pressure on executives to engage in earnings management. In non-innovative firms, this study argues that executives are motivated to conduct earnings management regardless of the reasons. In addition, it claims that the pressure experienced by executives in innovative firms is greater than that in non-innovative firms, and they are affected by the incentives related to meeting the innovation requirement. Therefore, our hypothesis is as follows:

H6: Firms that use innovation strategies have higher levels of earnings management than non-innovative firms.

Our focus on the preferred method is motivated by the current debate on whether accruals are still utilised by executives in earnings management studies. Furthermore, there has been a significant increase in the number of studies showing the shift in executives' behaviours towards real activities. For instance, Graham, Harvey and Rajgopal (2005) interviewed executives and documented that, after the Sarbanes–Oxley Act of 2002, executives appeared to evaluate their earnings management and lean towards real activities. Similarly, Cohen, Dey and Lys (2008) provided evidence supporting the moves into real activity manipulation. However, Zang (2007) concluded that discretionary accruals and real activities are both utilised in a firm to achieve certain incentives. This study argues that the timing of the manipulation can provide a better understanding of the preferred method and executives' behaviours.

In discretionary accruals, accounting choices can be achieved prior to the release of financial reports. However, in real activity manipulation, prior knowledge is required and must occur during a particular period. In other words, executives can commit accrual manipulation after the year's end while real activities manipulation cannot. Executives will not, however, generally engage in manipulating financial statements if they can meet their incentives without managing earnings; therefore, it should be ensured that executives have ample information regarding earnings towards the end of the year. Since innovation expenditures require prior knowledge during the year, executives may likely engage in accruals primarily and mostly to protect innovation. Not only can this be accomplished at the end of the year, but it is also likely to be less costly for firms due to the effect of real activities on cash accessibility for funds. As a result, it is fair to say that executives tend to manipulate accruals more often than real activities.

The following hypothesis is suggested.

H7: Firms focused on the innovation strategy are more likely to engage in earning management by utilising accrual methods.

3. METHOD

3.1 Sample Selection

This study considers three discretionary accrual models and real activities models in our test, standard Jones, the modified Jones model, the Kothari model, the abnormal cash flow model, and the abnormal production and abnormal discretionary expenditure model. This study restricts the sample to the UK having both innovative and non-innovative firms from 2010 to 2019 and that implemented IFRS. This study excluded banks (SIC codes 4400–4999) and financial institutions (SIC codes 6000–6499) which have different incentives and regulations Following Burgstahler, Hail and Leuz (2006) it deleted firm years with extreme variable values in the top or bottom percentile in the models. It also deleted all firms having missing values, which affects the calculations of the variables. It used STATA, SPSS and Excel to generate our variables. All data were extracted from the OSIRIS Database. Our final dataset included 808 firms (260 innovative firms and 548 non-innovative firms).

This study tests the hypotheses by estimating the following regression:

$$\boldsymbol{EM = \alpha_0 + \beta_1 INV + + \beta_2\, FSize + \beta_3 CFO + \beta_4 lev + \beta_5 Pro + \beta_6 Ind + e..(1)}$$

In this research, all regression models under all of the stages are the same, and the only difference lies in the dependent variable, which is earnings management. This equation investigates the firms that recorded earnings management and supported innovations.

3.2 Variables Measurement

Accrual-Based Earnings Management Measures

Here, EM represents one of the earnings management models (standard Jones, modified Jones, Kachori, abnormal production and abnormal cash flow, and abnormal discretionary expenditures). Our variable of interest is INV, the proxy for innovation. Previous papers documented firm characteristics associated with earnings management, such as firm size, financial leverage (lev), and operating cash flow (CFO) and (Ind) industry (Jones and Sharma, 2001; Chung, Firth and Kim, 2005; Siregar and Utama, 2008; Gill et al., 2013) . Table 1 provides the detailed variable definitions.

$$\frac{TA_{i,t}}{A_{i,t-1}} = \alpha_1 \left(\frac{1}{A_{i,t-1}}\right) + \alpha_2\left(\frac{\Delta REV_{i,t}}{A_{i,t-1}}\right) + \alpha_3 \left(\frac{PPE_{i,t}}{A_{i,t-1}}\right) + \varepsilon_{i,t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \textbf{(1)}$$

$$\frac{TA_{i,t}}{A_{i,t-1}} = \alpha_1 \left(\frac{1}{A_{i,t-1}}\right) + \alpha_2\left(\frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t-1}}\right) + \alpha_3 \left(\frac{PPE_{i,t}}{A_{i,t-1}}\right) + \varepsilon_{i,t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \textbf{(2)}$$

$$\frac{TA_{i,t}}{A_{i,t-1}} = \alpha_1 \left(\frac{1}{A_{i,t-1}}\right) + \alpha_2\left(\frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t-1}}\right) + \alpha_3 \left(\frac{PPE_{i,t}}{A_{i,t-1}}\right) \alpha_4 ROA + \varepsilon_{i,t} \ldots\ldots\ldots\ldots\ldots\ldots \textbf{(3)}$$

where TA = the total accruals[1]; (i) during period (t); ΔREV = the change in the sales; ΔRECi, t = the change in accounts receivable; PPE = Property, Plant and Equipment; Ai t-1 = the total assets at the end of period (t-1); ROA = total income divided by total assets; and ε_{it} = the random error. All the variables, including the indicator variables, are scaled by total assets.

Real Activity-Based Earnings Management Measures

The most recent and advanced proposed theory (Roychowdhury, 2006; Cohen, Dey and Lys, 2008; Zang, 2011) offers a new approach to manipulation with studies stating three methods of manipulations. The first is the sales method: enhancing sales by providing increased sales discounts and providing lenient credit terms. The second is the production method: producing more goods than required to increase earnings. The third is the discretionary expenditure method: executives manipulate earnings by reducing the general admin and sales expenses and reducing research and development expenses.

Abnormal cash flow

$$\frac{CFOit}{A_{i,t-1}} = a_1 \left(\frac{1}{A_{i,t-1}}\right) + a_2 \left(\frac{SALES\ it}{A_{i,t-1}}\right) + a_3 \frac{\triangle sales\ it}{A_{i,t-1}} + \varepsilon_{i,t} \ldots\ldots\ldots\ldots\ldots\ldots (4)$$

Abnormal production:

$$\frac{PRODit}{A_{i,t-1}} = a_1 \left(\frac{1}{A_{i,t-1}}\right) + a_2 \left(\frac{SALES\ it}{A_{i,t-1}}\right) + a_3 \frac{\triangle sales\ it}{A_{i,t-1}} + a_4 \frac{\triangle sales\ it-1}{A_{i,t-1}} + \varepsilon_{i,t} \ldots\ldots (5)$$

Abnormal discretionary:

$$\frac{DISXit}{A_{i,t-1}} = a_1 \left(\frac{1}{A_{i,t-1}}\right) + a_2 \frac{\triangle sales\ it}{A_{i,t-1}1} + \varepsilon_{i,t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (6)$$

where $CFOi$t represents operating cash flow; Ai t-1 = the total assets for firm (i) at the end of period (t-1); $SALESit$ represents the sales for current period of firm; $\triangle\ sales\ it$ represents the change in sales for firm for current period; $DISXit$ represents the discretionary expenses including marketing expenses and general and admin expenses for firm for current period; PRODit represents the change in inventory and the cost of the goods sold for current period; $\triangle\ sales\ it$-1 represents the change in sales for prior period; and ε_{it} = the random error. This study did not include research and development since it is the value it measures.

Innovations Measurement

This study finds that most of the scholars utilise the modified Jones model and real activities over most existing models. Consistent with prior scholars, this study analyses earnings management activities using the modified Jones model. In addition, it finds strong models that claim to be

[1] In calculating the accruals, this study utilised the cash flow approach. Hribar and Collins (2002) argued that events could impact accruals that were calculated using a balance sheet. In fact, in mergers and acquisitions, when firms — specifically large firms — merge, an increase in accounts receivables is often seen.

superior to others. For instance, McNichols (2000) and Kothari, Leone and Wasley (2005) attempt to develop standard Jones models. Nevertheless, most of the studies believe the modified Jones model to be superior to accrual models and better at detecting revenue manipulation. The Kothari model is the only model among discretionary accrual models having a control variable of firm performance; therefore, this study argues that the model would be superior to the modified Jones model at detecting the manipulation of an innovation strategy. Therefore, since all of the models are claimed to be effective, this study argues that all models are able to detect earnings management, thus, the manipulation of innovation should be consistent in all models and any difference might be within the adjustment of the model.

Our primary goal is to identify the most accurate way to measure innovations. This study acknowledges that the innovation measurement requires internal knowledge about each firm, which is likely to be harder, costly and time-consuming to detect. Therefore, it examined prior research to identify their approaches. Different studies provide different methods of detecting innovations. For instance, some (Ittner, Larcker and Rajan, 1997) used new product releases, others (Koku, 2011) used press releases, and still others (Francis and Smith, 1995) used revenue from acquisitions, while Holthausen, Larcker and Sloan (1995) used patents. Nevertheless, the mainstream researchers utilised R&D expenses. Since R&D spending is the most common approach to measuring innovation because it is one of the inputs that is measured consistently across all firms, following prior research (Chaney, Devinney and Winer, 1991; Oswald and Zarowin, 2007; Osma and Young, 2009), the study measures innovation using research and development expenditures.

Next, this study examines the possible incentives to conduct innovations, focusing on the executives' incentives of increasing innovation (upward) and decreasing innovation (downward). Executives' motivations to reduce innovations are documented by prior research. However, it focuses on two manipulation incentives, and divides the innovations into two groups:

Upward innovations: it argues that executives are motivated to increase innovation when firms meet earnings targets, even with increased innovation. Therefore, their incentives might be to increase innovation in the current year as they are already meeting their goals. This study calls this upward innovation (higher income). Furthermore, firms may miss earnings objectives, even with decreased innovation; therefore, their incentives are to increase innovation. Since downward manipulation will not allow firms to reach their earnings targets, executives' incentives are to make their earnings worse by increasing innovation. It calls this group upward innovation too.

Downward innovation: it argues that executives are motivated to decrease innovation when firms meet earnings targets by decreasing innovation for the year. Therefore, their incentives could be to decrease innovation to meet earnings targets and to avoid reporting losses. Table 1 presents a summary for all study variables' definitions and measurements.

<INSERT TABLE 1 HERE>

4. RESULTS

4.1 Descriptive Statistics

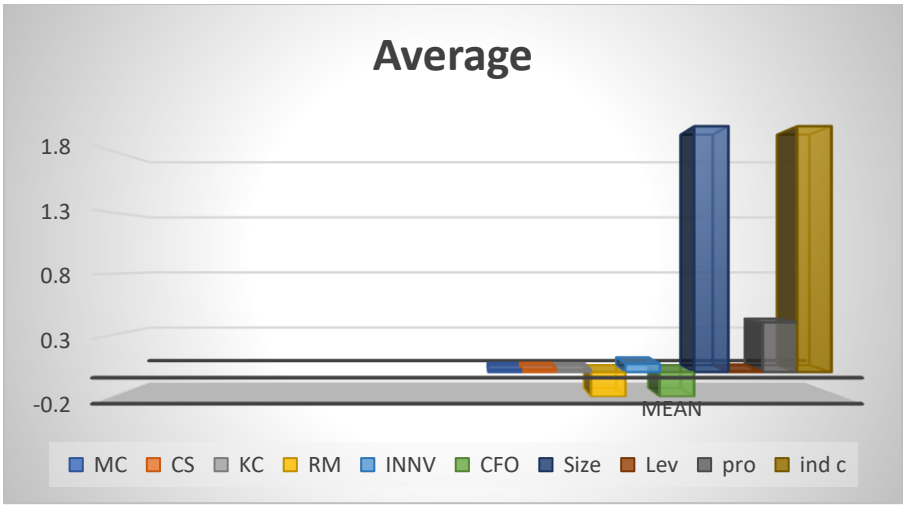
As presented in Table 2 and Figure 1, the mean values and the median values for all of the earnings management models are around zero, including the second analysis for non-innovation and innovated firms; this indicates that the accruals and real activities models are well fit to this data. This observation supports Hayes and Cai (2007), who found that the most suitable regression model was the one where the mean was around zero. This result is consistent with prior studies which were similar to the issues investigated in this study (Klein, 2002; Almasarwah, 2019), namely the impact of earnings management on firm performance. The study examined UK firms from 2009 through 2013 and reported mean values for real activities and accruals model around zero. Others have shown similarity, such as (Al-Shattarat (2017) who examined 70 firms for the period between 2000-2007 in New Zealand.

The study also reported mean values around zero. On the other hand, Arifin and Kusuma (2011) reported mean value for modified Jones around 1.0; the difference may be that, in their study, they used fewer country observations, Germany and the United States, and different of years observation, 2004 to 2007. Besides, Klein (2002), in the US, and Bhuiyan, Roudaki and Clark (2013), in Australia, found the mean values to be zero in four earnings models (standard Jones, modified Jones, performance-matched model and performance). Since the median values are around zero, this suggests that the earnings management models are free from outliers. The standard deviation is higher than other studies as higher standard deviation indicates higher earnings management (Ferramosca, 2018).

<INSERT TABLE 2 HERE>

As predicted in this study, a positive sign resulted in each economy for the firm size. The result was comparable to some degree with the study by John and Adebayo (2013) , as they reported mean values around 8%. This result indicated that firms having a better internal control system decreases manipulations. Also, larger firms take into consideration the reputation cost. The mean value of leverage is different from other studies such as who reported 0.03. The main difference in our study is that the number of observations is different in both studies, which may impact the results. Adjusted RD reported mean values of 0.06, which is predicted, as UK firms spend more on research and development than other economies. However, the results are higher than and as they reported 0.02 as our periods are different.

Figure 1. Study Variables Average



4.2 Correlation Matrix and Multivariate Analyses

Table 3 presents a correlation matrix; in these models, several variables have significant negative relationships with the earnings models, notably the CFO, and innovation, and leverage has a virtually non-existent association. This supports our hypothesis that there are negative correlations between real activities and innovation and also supports the hypothesis that downward innovation is negatively related to accruals. Consistent with prior literature operating cash flow is negatively correlated with a firm's manipulations. In contrast, size is positively correlated with innovations, suggesting that the size of the company may be as important as previously thought.

<INSERT TABLE 3 HERE>

The significant correlations between accruals models and real activities are expected, as executives may select both methods to achieve their incentives. Furthermore, the industrial appears to have an impact on both earning manipulations and innovation, consistent with prior literature that some industrial may be more innovative than others with empirical evidence on real and accrual earnings management due to upward and downward innovation.

The real activity model in downward incentives is statistically significant at $p<0.005$, and there is a positive relationship between the t-value (-3.56) and coefficient (-4.06**). This result supports **H1** that stated that executives in the UK economy reduce innovation spending when earnings can be achieved. The result leads us to conclude that executives in innovative firms might not be concerned about facilitating innovation as much as they are about earnings since earnings lead to more incentives for executives in the short term. Pressure to meet shareholders and analysts' earnings expectations triggers executives' short-term fixations. One way to achieve the expectations is reducing innovation spending. Ittner and Larcker (2001) documented the executive dilemma of investing in innovation for future payoffs. Consistent with this view,

Graham, Harvey and Rajgopal (2005) stated that executives reduce innovation in order to increase earnings. Furthermore, executives understand that earnings are one of the main variables that cause share movements, which leads to an increase in the value of a firm's common stock (Kormendi and Lipe, 1987). Also, these results suggest that the evidence regarding earnings management in discretionary expenditures is similar to the findings in Graham, Harvey and Rajgopal (2005) and Roychowdhury (2006) that firms increase the reduction of their discretionary expenditures for earnings; however, prior studies have included research and development while calculating discretionary expenditures, while, in our study, this is eliminated since it is part of the independent variables, which provides a more true result over other studies in our opinion.

Furthermore, for increased incentives, the result was also significant at $p>0.001$; there was a relationship in lower increased incentive as t-value (-8.61) and coefficient (-.482***). And for discretionary expenses as t-value (-6.81) and coefficient (-.008***). Therefore, these results support our **H2** and **H3,** whereby they are consistent with Graham et al. (2005) and (Zhu (2021). This study documented that abnormal cash flows and production would reduce innovation support, specifically when executives achieved their earnings targets. Innovative firms are sensitive to substantial cash flows because increased investment is correlated with contemporaneous cash flows. However, executives in the UK economy acknowledge that engaging in real activities will lower cash flows for their firms, and most likely innovation investment will have a greater impact on reducing cash flows. In addition, firms that have negative or lower cash flows as a result of accelerating abnormal activities may have serious problems, especially if they do not have access to equity financing (Brown and Petersen, 2009). In terms of discretionary expenses, our result may suggest that executives may not use reduction of other expenses than R&D to support innovation. One explanation could be that the reduction of marketing and other general admin may cause a serious problem within a corporation's operation as it is an essential service. For example, decrease of marketing may cause reduction of sales or reducing numbers of employees many cause high pressure or overload on other staff, which causes high turnover. Therefore, executives may select different methods to support innovation rather than decreasing other essential expenses.

The regression equation predicted a positive relationship between the models and innovations in increasing innovation incentives group and a negative relationship in decreasing innovation incentives group. Table 4 show that the t-values for innovation in each economy are very statistically significant at $p<0.001$. Regarding downward innovation, there are negative relationships, such as the MC t-value (-6.74) and coefficient (-.380 ***) the KC t-value (-6.70) and coefficient (-.380 ***), and SC t-value (-7.22) and coefficient (-.374 ***), which supports our **H4**. These results are consistent with prior studies (i.e. Gunny, 2010; Bereskin *et al.*, 2018).

This result is consistent with Jeppson (2013) and Shust (2014) who reported a negative relationship. The results might indicate that, overall, executives are more concerned about earnings when they can achieve earnings targets. Executives acknowledge that supporting innovation might generate benefits for them in the future, but not where earnings could suffer. Additionally, this result supports our prior result on real activity manipulation. Phillips, Pincus and Rego (2003) and Ayers, Jiang and Yeung (2006) documented the use of discretionary accruals as a proxy for earnings. Our finding went a step further to document that innovative firms use discretionary accruals by reducing innovation to increase reported income when income targets are achievable.

<INSERT TABLE 4 HERE>

Regarding increased innovation, there are negative relationships in the MC t-value (5.54) and coefficient (.0093***), the KC t-value (4.94) and coefficient (.0082***) and the SC t-value (5.19) and coefficient (.0086***). These results support our **H5**, which stated that there is a positive relationship between innovation strategy and accruals earnings management in the UK economy with increased incentives. These results are not consistent with prior studies, such as (Shust (2015). Our finding suggests that discretionary accruals in increased innovation are not used to support innovation strategies when firms meet earnings goals or when earnings are unachievable for firm years. Our result may indicate executives take advantage of and increased innovation spending when the opportunities were presented. However, Houmes and Skantz (2010) stated that firms with high market values tend to engage in earnings manipulation, which supports our finding, as executives are not as concerned about achieving higher and smooth earnings as they are about spending on innovation. One possible explanation is that executives understand the value of higher innovation for both the short term and long term. Innovation expenses could generate future economic benefits, but that may happen in the long run and executives may want to achieve these results as long as they do not outweigh the increase in earning overspending on innovations.

Table 5 presents the results of the Mann-Whitney U test used to evaluate the hypothesis that innovative firms have more manipulation than non-innovative firms. First, the normality test indicates that the p values are less than 0.5 for all the models. Therefore, this study has failed to meet the normality assumption for the t-test; thus, it conducts the Mann-Whitney U test. Table 6 shows that discretionary accruals models and real activities Z values are negative and significant at the necessary p values, implying that the difference in the ranking between innovative firms and non-innovative firms is valid as predicted. However, not surprisingly, discretionary accruals models have higher ranking values for innovative firms than non-innovative firms. This result provides the same perspective of prior studies, which stated that manipulation in innovative firms is higher than that in non-innovative firms; therefore, this result supports **H6.** These results are consistent with prior studies (i.e. Capalbo *et al.,* 2018). Real activities results indicate different results as the rankings of non-innovated firms are higher than innovated firms. This result supports the overall result of this paper that real activities manipulations do not offer much help to innovated firms; therefore, they are less engaged than non-innovated firms.

<INSERT TABLE 5 HERE>

RM resulted in Z= -.282 and p>.05. Innovated firms had a mean rank of 3002 while non-innovative firms had an average rank of 2989. For discretionary accruals, MC resulted in Z=-.394 and p<05. Innovative firms had a higher mean rank of 3381, while non-innovated firms had a mean rank of 3362. KC reported Z= -.310 and p<05. Innovative firms had a higher mean rank of 3379 while non-innovative firms had a mean rank of 3364. Lastly, SC reported Z= -.461 and p<05. Innovative firms had a higher mean rank of 3383 while non-innovative firms had a mean rank of 3002.

Although an explanation could drive this result, it is consistent with the economic values that are received from innovations. Innovative firms have higher expected earnings. This would provide

more incentives to executives to engage in manipulation. However, this may place less weight on non-innovative firms since they are under pressure to deliver only earnings expectations. This dynamic reinforces the incentive to achieve manipulations when innovation is available in firms to provide edges in the market.

In untabulated results, it finds a similar result. This finding is not in contrast to those of other studies using real activities, such as Jeppson (2013), who reported that innovative firms have more manipulation of both accruals and real activities. One explanation for the finding is that their theory was built on the fact that the most innovation is an indication of innovative firms and the least innovation is an indication of non-innovative firms. However, their study fails to consider that less innovation does not represent non-innovative firms. This study argues that the lower level of innovations is affected by the firm size, and cash flow availability, which, in turn, impact the amount of innovation. Furthermore, their study did not compare earnings management for both values using independent testing or any statistical tests. Therefore, it is argued that the findings of the current study provide stronger evidence regarding earnings management in innovative and non-innovative firms in both real activities and accruals.

Next, the study analyses the preferred methods executives utilise to conduct earnings management. The method it considers is the value of R-squared, which is consistent with prior studies.

It finds different patterns that are not similar between real activity and accruals presented in Table 4; however, the value for discretionary accruals was higher than that for real activities in the UK economy.

Now that this study has demonstrated the R2 results, it argues that the R-squared might not be the best approach to determine the preferred methods. This study finds that, while a higher R2 indicates a preferred method, the relationship is relatively small. Most notably, in abnormal activities, which are linked to earnings management, which can be affected by other variables that fall beyond the control of a firm. When this study includes any abnormal activities, an executive in a firm might not be utilising earnings manipulation, but, rather, may be responding to an economic change. For instance, economic performance, interest rates and regulatory changes might force executives to overproduce or accelerate sales. Thomas and Zhang (2002) documented that, even with the existence of abnormal manipulation, they could not rule out the economic conditions that may impact firms, which impacted their results. Another case is when executives want to offer a massive discount to push the products and reduce inventory storage costs. Real activities consider this action to be abnormal, and, therefore, it can be considered earnings manipulation Accruals models also suffered from the distinction between discretionary accruals and nondiscretionary accruals, which could bias the earnings management results in the same way that abnormal activity models suffer from the omission of economic changes. Therefore, this study rules out that these results support **H7.** This result is inconsistent with prior studies (i.e. Gunny, 2010).It also, found that it was challenging to engage executives in this qualitative research to discover the preferred method. It is clear from our analysis that which method is preferred remains a difficult question to answer without knowledge of executives' motivations. Future research might be able to engage executives in qualitative methods.

<INSERT TABLE 6 HERE>

In our research model, this study uses several control variables. The results are shown in Table 4and are consistent with what is predicted by our hypotheses regarding the impact of cash flows on earnings management. CFO was negative across all regressions, which was consistent with the results of Brown and Petersen (2009) that a negative relationship is indicator of a distressed situation that is caused by increased earnings management. Leverage is negative and significant, in line with the idea that earnings management in innovated firms, as the contractual commitments of increase debts, lowers the cash flow availabilities, which impacts the funding of innovations. Where growth is negative and significant, it can be due to the agency cost of free cash flow, where executives invest in innovation, but in negatives net present values projects. Unlike other studies, size results were negative and significant, the difference is due to not classifying the firms by size, as earnings management for firms is enhanced because large firms typically have strong internal controls and governance mechanisms, and care about their reputations. Profitability has a positive impact on both earnings' management approaches. As a result, it would appear that companies with lower profits tend to engage in manipulations. In order to assess the impact of the industrial sector, the study uses regression models with and without industry. The result indicates that the industrial sector did not alter the coefficients. Yet it has affected only R2 real activity and evidence is documented to suggest that industrial is not as important as has been presented in prior studies. However, it also explains that earnings management and innovation behaviours of executives are the same across industrial sectors.

5. CONCLUSION

This paper discusses the characteristics of innovations and earnings management and focuses on internal innovation and earnings management design in the prior literature. Next, it discusses the executives' techniques used to support their innovation strategies. It then discusses these techniques from the perspective of what it knows about innovations and what it has found. For instance, to fund such risky, costly and uncertain projects, it can be argued that executives tend to use earnings management because external investors are sceptical about investing in risky projects without having inside information (Kou, Yang and Chen, 2020). Limitations regarding the project are that is considered to generate future economic benefits increase the risk of the project and, therefore, investors are likely to not invest in such a project. Aboody and Lev (2000) also indicated that information asymmetries exist in every substantial investment, and these asymmetries play a significant role in investors' decisions regarding whether to invest in innovation projects.

This paper explores innovation strategies in the context of earnings management in the UK economy. The innovation literature suggests that innovative firms have higher levels of earnings manipulation than non-innovative firms and argues that firms with innovation require consistent funding, and, since it is challenging to obtain outside funding, executives use earnings management in order to support innovation in these firms. These challenges are not as evident in non-innovative firms; therefore, an innovative firm's executives experience more significant levels of pressure. The results of the analysis employed in this research indicate that innovative firms have higher mean in discretionary accruals than non-annotated firms, but not in real activities, which aligns with our predictions and the findings of other studies in discretionary accruals only.

This study predicted that innovative firms would have a positive relationship with accrual manipulation under increased innovation incentives and that spending on innovation would

provide an advantage to firms since they achieved earnings targets or earnings targets are unachievable. It documented a positive relationship between discretionary accruals and innovation in increased incentives. This indicates that the executives in these groups more profoundly focus on innovation, which might be an essential component for the period after the 2008 recession, while the potential gain from having higher earnings may not affect the innovation outcome.

Consistently, under downward innovation, it finds that earnings management models provide different results. All of the discretionary accruals provided a negative relationship for the UK economy. This finding supports our previous finding that executives in these economies do not simply choose innovation over earnings. A potential explanation is that firms' earnings are more likely to provide executives with better incentives. In addition, executives are more concerned about enhancing earnings since they are concerned about the outcome and the failure of innovation; therefore, they cautiously pursue innovation when earnings are suffering.

This study predicted that innovative firms would have a negative relationship with real activities manipulation in both upward and downward innovation. Our results support our predications. It could be concluded that executives in innovative firms are concerned with earning more in the short term than promoting innovation. Earnings will always supplant innovation in the pursuit of profitability. A further factor is that, since executives manage accruals to support innovations, earnings will be endorsed from real activities. As well, real activities do not offer sufficient assistant for innovation as accruals do.

Furthermore, it predicted that the executives of innovative firms would be more likely to engage in discretionary accruals than in abnormal activities. Our results agreed with our predications. However, it argues that the R-squared is not the best method to determine executives' levels of engagement in earnings management. Among many reasons, the evaluation of abnormal activities is affected by the omission of other variables, such as economic performance and business performance. In addition, abnormal change results can be misleading as what is considered abnormal could include normal strategic business decisions that most executives use. For example, the acceleration of sales might be purely based on a strategic decision to increase the market share or increase the sales of a specific product. Accruals also suffer from discretionary and nondiscretionary calculations.

This study argues it is very challenging to determine the preferred method without considering executives' motivations and the investment decision tree. Therefore, this paper uncovers which method is preferred, but it remains a difficult problem that necessitates future investigation using both qualitative and quantitative methods to confirm the finding.

There are numerous areas that have not been covered by this research but which deserve further consideration in future studies. Our research has demonstrated that standard Jones and modified Jones models, which are models used by previous researchers, are not well-specified and are not very effective in identifying earnings management in UK firms. The Peasnell, Pope and Young accruals model appears to be better in this context and our recommendation is, therefore, that more studies should be undertaken in the UK and possibly in other developed economies, using the PPY model. Furthermore, replication of this research methodology in developed economies is likely to provide in-depth information that allows these countries to explore the strengths of their innovation mechanisms and earnings management, which will also allow countries with weak innovation

mechanisms to address these weaknesses and to, accordingly, reduce earnings management practices in their firms.

6. .IMPLICATIONS

Regulatory bodies, shareholders, and executives should all be mindful of the many ramifications of their business strategy selection. Any of these stakeholder categories will be significantly impacted by how a firm's creative approach relates to the knowledge found in its earnings and the degree to which such firms manage earnings. It could assist regulators in determining the reason firms with an emphasis on creativity are more (or less) willing to manipulate earnings. With the rise in accounting fraud in recent years, this field is likely to be of interest to a large number of policy makers. Also, in this research, a combination of using real and accruals earnings management led to the complementarity of our results to support each other. On the other hand, some potential challenging could occur between earnings management models.

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TABLES

Table 1. Main Variable Descriptions

Code	Variable	Measurement
MC	Discretionary accruals	Standard prediction from the (Dechow, Sloan and Sweeney, 1995) Model.
CS	Discretionary accruals	Standard prediction from the standard Jones model.
KC	Discretionary accruals	Standard prediction from the (Al-Khouri, 2012) Model.
RM	Abnormal activities	Standard prediction from the (Roychowdhury, 2006) Models. abnormal cash flow, abnormal production, and abnormal discretionary expenses.
RM2	Abnormal activities	Standard prediction from the (Roychowdhury, 2006) Models. abnormal cash flow and abnormal production.
RM3	Abnormal activities	Standard prediction from the (Roychowdhury, 2006) Models. abnormal discretionary expenses
INNV	Innovation	The research and development scaled by lagged total assets.
CFO	Cash flow	Cash flow from operating scaled by lagged asset.
Size	Firm Size	Logarithms of total assets
Lev	Leverage	Total debts scaled by total assets for firm i in year t;
pro	Profitability	Dummy variable, one for firm with positive income, and 0 otherwise.
ind c	Industry	Dummy variable, first two-digit numbers of industrial code.

Table 2. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
MC	2504	0.020	0.093	-0.069	0.728
CS	2504	0.021	0.094	-0.042	0.720
KC	2504	0.019	0.092	-0.074	0.729
RM	2504	-0.661	2.914	-20.356	9.802
INNV	2829	0.068	0.906	-6.109	30.651
CFO	2829	-8.696	5.393	-28.886	67.178
Size	2829	5.122	1.181	1.186	9.029
Lev	2829	0.006	0.039	-0.063	1.449
pro	2829	0.404	0.491	0.000	1.000
ind c	2829	27.511	12.164	10.000	55.000

Table 3. Correlation Matrix

	Variables	(MC)	(RM)	(INNV)	(CFO)	(Size)	(Lev)	(pro)	(ind_c)
Modified Jones and Real EM	MC	1.000							
	RM	-0.401***	1.000						
	INNV	0.161***	-0.203***	1.000					
	CFO	-0.131***	-0.028	-0.008	1.000				
	Size	-0.424***	0.346***	-0.106***	0.050***	1.000			
	Lev	0.301***	-0.081***	0.088***	-0.047**	-0.121***	1.000		
	pro	-0.001	0.015	-0.030*	-0.008	0.002	-0.031*	1.000	
	ind_c	0.042**	-0.078***	0.043**	-0.014	-0.091***	-0.015	0.040**	1.000
	Variables	(CS)	(RM)	(INNV)	(CFO)	(Size)	(Lev)	(pro)	(ind_c)
Standard Jones and Real EM	CS	1.000							
	RM	-0.390***	1.000						
	INNV	0.157***	-0.203***	1.000					
	CFO	-0.114***	-0.028	-0.008	1.000				
	Size	-0.451***	0.346***	-0.106***	0.050***	1.000			
	Lev	0.309***	-0.081***	0.088***	-0.047**	-0.121***	1.000		
	pro	0.004	0.015	-0.030*	-0.008	0.002	-0.031*	1.000	
	ind_c	0.046**	-0.078***	0.043**	-0.014	-0.091***	-0.015	0.040**	1.000
	Variables	(KC)	(RM)	(INNV)	(CFO)	(Size)	(Lev)	(pro)	(ind_c)
Kothari and Real EM	KC	1.000							
	RM	-0.391***	1.000						
	INNV	0.151***	-0.203***	1.000					
	CFO	-0.133***	-0.028	-0.008	1.000				
	Size	-0.414***	0.346***	-0.106***	0.050***	1.000			
	Lev	0.300***	-0.081***	0.088***	-0.047**	-0.121***	1.000		
	pro	0.001	0.015	-0.030*	-0.008	0.002	-0.031*	1.000	
	ind_c	0.048**	-0.078***	0.043**	-0.014	-0.091***	-0.015	0.040**	1.000

**** p<0.01, ** p<0.05, * p<0.1*

Table 4. Regression results

	UPWARD ACCRUALS			DOWNWARD ACCRUALS					
	MC	**KC**	**CS**	**MC**	**KC**	**CS**	**RM**	**RM2**	**RM3**
INNV	0.00924***	0.00821***	0.00852***	-0.369***	-0.370***	-0.364***	-3.817**	-4.82**	-0.008***
	(5.48)	(4.90)	(5.13)	(-6.74)	(-6.42)	(-6.89)	(-3.25)	(-8.61)	(6.81)
CFO	-0.00001***	-0.00001***	-0.00001***	0.0006	0.0007	0.0006	-0.0151	-0.0146	-0.00051
	(-5.65)	(-5.76)	(-4.62)	(1.12)	(1.16)	(1.18)	(-1.21)	(-1.22)	(-0.97)
Size	-0.0302***	-0.0325***	-0.0291***	-0.0230	-0.0234	-0.0232	-0.0680	-0.0950	0.0270*
	(-21.84)	(-21.19)	(-23.88)	(-1.75)	(-1.78)	(-1.92)	(-0.25)	(-0.34)	(2.22)
Lev	0.566***	0.564***	0.582***	2.528	3.641	1.713	-91.62	-93.40	1.777
	(13.78)	(13.80)	(14.36)	(0.34)	(0.48)	(0.25)	(-0.60)	(-0.58)	(0.25)
pro	0.000590	0.000927	0.00142	-0.0259	-0.0259	-0.0219	0.491	0.479	0.0115
	(0.18)	(0.28)	(0.43)	(-0.87)	(-0.87)	(-0.80)	(0.81)	(0.76)	(0.42)
Ind_c	-0.00293**	-0.00283*	-0.00336**	0.00596	0.00564	0.00530	0.0508	0.0557	-0.0048
	(-2.64)	(-2.56)	(-3.06)	(0.55)	(0.52)	(0.53)	(0.23)	(0.24)	(-0.48)
cons	0.178***	0.171***	0.192***	0.116	0.114	0.121	0.111	0.265	-0.153*
	(21.23)	(20.52)	(23.22)	(1.59)	(1.57)	(1.81)	(0.07)	(0.17)	(-2.27)
R-sq	0.263	0.254	0.285	0.694	0.693	0.722	0.344	0.353	0.622

*** *p<0.01*, ** *p<0.05*, * *p<0.1*

Table 5. Regression results

	UPWARD ACCURLAS			DOWNWARD ACCRUALS					
	MC	**KC**	**CS**	**MC**	**KC**	**CS**	**RM**	**RM2**	**RM3**
INNV	-3.807**	-0.487***	-0.00808***	-0.368***	-0.369***	-0.363***	0.00936***	0.00833***	0.00866***
	(-3.30)	(-8.70)	(-6.78)	(-6.48)	(-6.49)	(-6.95)	(5.55)	(4.97)	(5.21)
CFO	-0.0152	-0.000	0.000	0.000	0.000	0.000	-0.000	-0.000	-0.000
	(-1.24)	(-2.72)	(-6.51)	(1.12)	(1.15)	(1.17)	(-5.70)	(-5.61)	(-4.767)
Size	-0.0657	0.778***	0.0266***	-0.0227	-0.0231	-0.0230	-0.0298***	-0.0288***	-0.0321***
	(-0.25)	(17.00)	(27.27)	(-1.75)	(-1.78)	(-1.93)	(-21.66)	(-21.02)	(-22.66)
Lev	-97.890	-1.563	-0.465***	1.792	2.945	1.060	0.568***	0.566***	0.584***
	(-0.66)	(-1.14)	(-15.99)	(0.24)	(0.44)	(0.16)	(12.80)	(13.82)	(14.28)
pro	0.483	0.0454	-0.001	-0.027	-0.027	-0.023	0.002	0.002	0.003
	(0.81)	(0.42)	(-0.57)	(-0.91)	(-0.91)	(-0.84)	(0.52)	(0.61)	(0.82)
_cons	0.288	-4.597***	-0.148***	0.137*	0.134*	0.139*	0.167***	0.161***	0.180***
	(0.23)	(-18.71)	(-28.23)	(2.22)	(2.17)	(2.46)	(22.63)	(21.88)	(24.64)
R-sq	0.343	0.144	0.346	0.691	0.690	0.720	0.261	0.252	0.283

*** *p<0.01*, ** *p<0.05*, * *p<0.1*

Table 6. Mann-Whitney U for Accruals and Real Activities

Variable	Z	Asymp. Sig. (2-tailed)	Kolmogorov-Smirnov Z.	t-TEST	Mean Rank-non innovative firms	Mean Rank-innovated firms
MC	-.394	..694	4.853	.000	3381.40	3362.69
CS	-461	. .645	5.355	.000	11215.06	11722.27
CK	-310	.756	4.935	.000	3383.27	3361.27
RM	-282	.778	6.931	.001	2989.49	3002.18