

Review paper

## AN OVERVIEW OF EARNINGS MANAGEMENT MEASUREMENT APPROACHES: DEVELOPMENT AND EVALUATION\*

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**Abstract.** *Earnings management practice has received much consideration and interest from regulators and practitioners as well as academics, with literature in the accounting field providing three key approaches for the identification of the various practice levels and techniques, including aggregate accruals, specific accruals and statistical distribution approach. Despite the fact that many studies have been directed towards enhancing the overall power and specification of each approach, there are nevertheless pros and cons linked with the application of each model. This paper provides and reviews the literature available on the development and assessment of such frameworks in an attempt to emphasize the various points studies should be considering when identifying earnings management.*

**Key Words:** *earnings management, measurement of earnings management, aggregate accruals approach, specific accruals approach statistical, distribution approach.*

### INTRODUCTION

The concept of earnings management has received much consideration and interest from regulators and practitioners in the field, with the literature referring to this practice through the use of various terms, including accounting manipulation, aggressive accounting, creative accounting, earnings management, and income smoothing (Stlowy and Breton, 2004; Atik 2009). Earnings management occurs when management direct their judgment and utilize estimated permitted by accounting standards or structure transactions in order to amend financial reports with the aim of misleading stakeholders in regard to

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the firm's economic performance, or otherwise to impact contractual outcomes that rest on the accounting figures reported (Healy and Wahlen, 1999). Such a practice does not commonly go against any accounting standards (Marai and Pavlović, 2013).

Despite the commonly held view that earnings management is prevalence practice within the companies, it remains that it has been remarkably difficult for researchers to document such a practice (Healy and Wahlen, 1999). Such a difficulty arises mainly owing to the fact that earnings management is unobservable, meaning its magnitude cannot be measured directly. Accordingly, for researchers to establish whether or not earnings have undergone management there is a need for earnings to be estimated prior to earnings management effects being seen.

The second issue is the fact that earnings management may be carried out through a number of different techniques, which causes difficulties in terms of establishing precisely which techniques have been utilized in order to amend the earnings reported. Since earnings are the sum of cash flow and accruals, earnings can be manipulated through the use of accruals and/or operating cash flow, as highlighted by (Xu, Taylor and Dugan, 2007). The use of accruals for earnings management is referred to as accounting-based earnings management, which encompasses the use of judgments or estimates permitted by accounting standards, namely through salvaging values of long-term assets and expected lives, deferred taxes, losses from asset impairments and bad debt, obligations for pension benefits and other post-employment benefits; the management of through operating cash flow is referred to as real earnings management, which encompasses changes in production, debt–equity swaps, discretionary expenditures and the reduction of prices (Xu, Taylor and Dugan, 2007).

When reviewing the accounting literature, three different study designs are recognized as widely used in identifying earnings management, namely aggregate accruals, specific accruals and the statistic distribution of earnings, as recognized by McNichols (2000). Despite the fact that all of these methods are centered on various ideas and assumptions to provide a solution to the previously highlighted problems, there is no sole technique with the ability to completely answer the mean questions in relation to magnitude, and the techniques of earnings management. This paper has the aim of presenting and discussing the estimating methods and the assumptions developed by each of the approach in regard to dealing with previous problems. Moreover, it also seeks to emphasize some of the points needing to be taken into account by researchers when selecting the most suitable amongst the research designs available. This discussion is centered on introducing and reviewing the literature in terms of how each approach has developed and is assessed.

### 1. AGGREGATE ACCRUALS APPROACH

This method is essentially centered on two assumptions, the first of which is concerned with overcoming the problem that arises from techniques that managers can use to alter reported earnings. In this way, the assumption is made that accruals give management the ability and resources to manage reported earnings in comparison with cash earnings, which are less likely to be managed owing to the difficulties associated with their manipulation. As has been mentioned by Paul M. Healy (1985), managers exercise discretion over discretionary accrual only. The second assumption underpinning this method is that total

accruals are elements of non-discretionary and discretionary, the former of which represents the choices made by the management to alter reported earnings. Accordingly, the common starting point for the measurement of earnings management is the calculation of total accruals. Subsequently, a certain framework is utilised for the estimation of the non-discretionary element of total accruals, facilitating total accruals to be decomposed into a non-discretionary and discretionary component (Dechow, Sloan and Sweeney, 1995).

In an attempt to break down total accruals into discretionary accrual and non-discretionary accrual elements, a number of different models have been devised by researchers, ranging from the more simple ones in which total accruals are utilized as an alternative for discretionary accruals, and subsequently spanning to the more complex, where regression analysis is utilized in order to do so. The literature review of the models adopted most commonly will be discussed in this subsection.

### **Healy (1985)**

The study of Healy (1985) is the first to have presented total accruals as a measure for earnings management. Through this study, he suggests that total accruals encompass non-discretionary and discretionary accrual aspects, but ultimately does not provide a distinction between discretionary accruals and non-discretionary accruals; rather, the assumption is made that total accruals are equal to non-discretionary accruals when there is no presence of earnings management. This suggests that total accruals are equal to non-discretionary accruals, with both representing earnings prior to the impact of earnings management during the period of estimation, which may be presented symbolically as highlighted below:

$$NDA_{\tau} = \frac{\sum_t TA}{T}$$

NDA: estimating discretionary accruals for the firm I in a given time t.

TA: total accruals, defined as the difference between reported earnings and operating cash flows.

T= 1, 2, ... T is a year subscript for the years included in the estimation period; and  $\tau$  = a year subscript indicating a year in the event period.

### **DeAngelo (1986)**

In much the same way as Healy (1985), DeAngelo (1986) implements total accruals as a proxy for earnings management, with a definition of total accruals as the difference between operating cash flows and net income. She further emphasizes that TA (total accruals) encompass both NDA (non-discretionary) and DA (discretionary) elements. In contrast, however, the model presented by Healy was criticized by DeAngelo in the sense that, if NDA is considered to be too large in comparison to TA, the latter measure would then be considered a poor alternative for the degree of earnings management in period  $t=1$ , and thus, for her research, NDA may be considered too significant and systematically negative for a large number of organizations—even those lacking in systematic manipulation. In this way, an empirical observation has been made that  $TA < 0$  has the ability to create an erroneous inference that management had intentionally understated earnings, when the more precise explanation is that total accruals commonly comprise a (material) negative

non-discretionary elements. As a substitute, a non-zero benchmark was developed for the "normal" or expected total accrual in periods before the management buyout. For this reason, the total accrual in the immediately prior period is taken as a benchmark for what the current accrual would be without income manipulation.

More specifically, DeAngelo (1986) examined whether or not the 'abnormal' total accrual's average value is notably negative for the sample firms in periods before the buyout (Jones, 1991). This particular average is calculated as described as follows:  $(TA_t - TA_{t-k}) = (DA_t - DA_{t-k}) + (NDA_t - NDA_{t-k})$ . This model and the implications of such are interpreted by DeAngelo as proof of a systematic earnings understatement. Such a view relies on the assumption that the general change in non-discretionary accruals  $(NDA_t - NDA_{t-k})$  is approximately zero, where a notable average decrease in total accruals  $(TA_t - TA_{t-k})$  mainly represents a notable average decrease in discretionary accruals  $(DA_t - DA_{t-k})$ .

### Jones (1991)

The study by Jones is the first to have presented the model where total accrual changes may be predicted through the use of explanatory variables. It has been observed that total accrual changes are likely to arise in some way from the organization's economic position (non-discretionary accruals), meaning that total accrual changes may be the outcome stemming from earnings without manipulation. For instance, if non-discretionary accruals are a function of revenue, the negative changes witnessed through the accruals may be owing to the non-discretionary changes as opposed to the discretionary accruals.

In contrast, the researcher also takes into account the fact that total accrual changes may result from discretionary accrual changes; in this instance, this is earnings management. Accordingly, in an attempt to control the impacts of economic circumstances in regard to total accruals—otherwise stated the non-discretionary accrual changes in total accruals—the expectation model detailed below may be utilised.

$$\frac{TA_{it}}{A_{it-1}} = \alpha_i \left[ \frac{1}{A_{it-1}} \right] + b_{1i} \left[ \frac{\Delta REV_{it}}{A_{it-1}} \right] + b_{2i} \left[ \frac{PPE_{it}}{A_{it-1}} \right] + \epsilon_{it}$$

Total Accruals = Non-Discretionary Accruals + Discretionary Accruals  
where:

$TA_{it}$  = total accruals in year t for firm i;

$\Delta REV_{it}$  = revenues in year t less revenues in year t-1 for firm i;

$PPE_{it}$  = Gross property, plant, and equipment in year t for firm i;

$\epsilon_{it}$  = error term in year t for firm i;

$I = 1 \dots N$ , firm index;

$T = 1 \dots T_i$ , year index for the years included in the estimation period for firm I (it ranges between 14-23 years).

As can be seen in above equation, the calculation of total accruals may be performed as following: The change in non-cash working capital before income taxes payable less total depreciation expense. Gross property, plant, and equipment and change in revenues are included in the expectations model to control for changes in nondiscretionary accruals induced by changing conditions. Revenues are utilised with the aim of controlling for the organisation's economic setting owing to the fact that they are an objective measure of the

operations of the firm prior to the manipulations induced by management, although notably they are not entirely exogenous. All of the elements encompassed within the accruals expectations model are scaled by lagged assets in order to decrease heteroscedasticity. Through the utilisation of the longest time series of observations available before Year 1 for all firms and the ordinary least squares, the estimation was made by Jones of  $\alpha_1$ ,  $b_1$ , and  $b_2$ ; of  $\alpha_i$ ,  $\beta_{1i}$ , and  $\beta_{2i}$ , respectively. Following the estimation of the parameters outlined in the equation above, these will be incorporated within the following model with the aim of assessing the prediction error in the event period, which represents earnings management in the prediction (event) period. In line with the assumption that the link between the explanatory and non-discretionary accruals is stationary, the following outlines the prediction error:

$$u_{ip} = \frac{TA_{ip}}{A_{ip-1}} - \left( \alpha_i \left[ \frac{1}{A_{ip-1}} \right] + b_{1i} \left[ \frac{\Delta REV_{ip}}{A_{ip-1}} \right] + b_{2i} \left[ \frac{PPE_{ip}}{A_{ip-1}} \right] \right)$$

Discretionary Accruals = Total Accruals - Non-Discretionary Accruals  
where:

$u_{ip}$  = The prediction error.

The P = year index for the years included in the prediction period.

The prediction error ( $\mu_{ip}$ ) signifies the degree of discretionary accruals in firm I at time p (prediction period) and subsequently demonstrates the earnings management of the firm at time p.

#### Dechow et al. (1995)

The overall performance of previous accruals-based models, such as those by Healy (1995), DeAngelo (1986), Dechow and Sloan (1991) and Jones (1991), is assessed by Dechow et al. (1995) with the aim of drawing a comparison between these and the new amended version by Jones. Consideration is directed towards the As can be seen in above equation modified version, with the view held that the standard Jones specification may be taken as being unable to capture the effects of sales-based manipulation owing to the fact that sales changes are recognised as giving rise to non-discretionary accruals. Accordingly, the new version has been developed with the aim of eradicating the conjectured tendency of the Jones model so as to ensure the discretionary accruals with error can be measured when discretion is exercised over revenues. In the newer version, non-discretionary accruals are predicted throughout the period of the event, i.e. during the times for which there is the hypothesis of earnings management, as following (Dechow et al., 1995):

$$NDA_{\tau} = \alpha_1 \left( \frac{1}{A_{\tau-1}} \right) + \alpha_2 (\Delta REV_{\tau} - \Delta REC_{\tau}) + \alpha_3 (PPE_{\tau})$$

where:

$\Delta REC_{\tau}$  = net receivables in year  $\tau$  less net receivables in year  $\tau-1$  scaled by total assets at  $\tau-1$ .

The estimates of  $\alpha_1$ ,  $\alpha_2$ ,  $\alpha_3$  and non-discretionary accruals throughout the period of estimation (during which there is no systematic earnings management hypothesis) are those gathered through the original model presented by Jones. The only change relative to the first model of Jones is that revenue changes are amended in line with the change in receivables during the period of event. The preliminary model directly suggests that discretion is not adopted in regard to revenue through either the event or estimation period.

The modified version makes the direct assumption that all credit sales changes during the event period are an outcome of earnings management owing to the fact that earnings are managed more easily through exercising discretion over the acknowledgment of credit sales revenue than through exercising discretion over the cash sales revenue. If such changes are recognised as successful, the earnings management predictions should then be unbiased in the case of those samples where earnings management has been implemented through revenue management.

### Peasnell, Pope and Young (2000)

Peasnell et al. (2000) have provided a different cross-sectional model centred on predicting unusual accruals, referred to as the margin model. Comparable to the original model presented by Jones, as well as the modified version, a two-stage approach is utilised in order to predict unusual accruals. The primary phase comprises the regression of accounting accruals on a course of explanatory variables aimed to capture those accruals that have not been managed. Unlike the two previous models, deferent explanatory variables are included within the first-phase regression, which are taken from a formal framework that provides a link between accruals, earnings and sales. A further deferent from other models is the application of WCA (working capital accruals) as opposed to TA (total accruals), as well as the exclusion of depreciation from the margin model. As has been discussed through the work of (Peasnell et al., 2000), the justification behind the exclusion of depreciation from accruals measure is the fact that such an item is an inadequate instrument in systematic earnings management. Furthermore, appropriate tool for such estimation is modelling change in working capital accruals through three key aspects, namely creditors ( $\Delta$ CREDIT), debtors net of bad debt allowance ( $\Delta$ DEBT) and stocks ( $\Delta$ STOCK), each of which may be further described below (Peasnell et al., 2000):

$$\Delta$$
STOCK = PUR – COGS (1)

$$\Delta$$
DEBT = REVC – CRC – BDE (2)

$$\Delta$$
CREDIT = PUR – CPS (3)

Where PUR is purchases of materials, COGS is cost of finished goods sold, REVC is revenue from credit sales, CRC is cash received from customers, BDE is the bad debt expense, and CPS is cash paid to suppliers. It should be acknowledged that, although  $\Delta$  STOCK in (1) encompasses inventories of materials, works-in-progress and completed goods, all intermediate transfers between such inventory categories involve the cancelling of entries that can be ignored when inventories are aggregated.

The second aspect is a modeling WCA, as shown below:

$$\begin{aligned} \text{WCA} &= (\Delta$$
STOCK –  $\Delta$ DEBT) –  $\Delta$ CREDIT + OTHER = \\ &= (\text{REVC} – \text{COGS} – \text{BDE}) + (\text{CPS} – \text{CRC}) + \text{OTHER} \\ &= \text{sm} \cdot \text{REVC} – \text{cm} \cdot \text{CRC} + \text{OTHER} \end{aligned} \quad (4)

where sm equals the gross margin on recorded sales, cm equals the gross cash contribution on cash collections from customers, and OTHER includes all non-cash current assets besides stocks and trade debtors, and all current liabilities besides creditors. The postulation is made that OTHER is orthogonal to REVC and CRC in equation (4). The aim is that equation (4) establishes accrual recognition prior to being impacted through earnings management. Working capital is communicated as the total of two contributory margins,

namely the margin on cash received, referred to as the 'cash margin', and the gross margin on its cash flow analogue and sales.

Through the application of this method, working capital accruals that are not established through sales and cash collections throughout the specified time are recognised as 'abnormal', and therefore are recognised as being the most probable to manifest (discretionary accruals) earnings management.

Equation (4) is utilised on an empirical basis through the application of the OLS regression tool, with Peasnell et al. (2000) also examining the ability to identify accrual management by adopting a cross-sectional prediction approach; the academics suggest that a greater ability to identify systematic earnings management can be seen through a working capital accrual measure when compared with a total accruals measure. When drawing a comparison between the models by Jones and the modified Jones version, and their own margin model, it was established that the modified version of Jones is more capable of identifying revenue-based manipulation, whilst the margin model is more capable of highlighting non-bad debt expense manipulations.

#### **Kothari et al. (2005)**

Kothari, Leone and Wasley (2005) presented a new model centred on identifying earnings management, with the model referred to as Performance Matching. The scholars also drew a comparison between the model efficiency in contrast with the regression-based approach, more specifically the original and amended models of Jones. In much the same way as the Jones model, this model utilises residuals from the annual cross-sectional industry regression, although there are two main differences: the first is the fact that it comprises return on assets, which is used to control for organisational performance; the second involves the use of a constant, which provides a greater degree of control in terms of heteroskedasticity, and it further elementalises the issues associated with an omitted scale variable and allows the discretionary measure to be more symmetric. The model is seen as follows (Kothari et al., 2005):

$$TA_{it} = \beta_0 + \beta_1 \left( \frac{1}{ASSETS_{it-1}} \right) + \beta_2 \Delta SALES_{it} + \beta_3 PPE_{it} + \beta_4 ROA_{it(or\ it-1)} + \epsilon_{it}$$

where  $TA_{it}$  = total accruals predicted as the change in non-cash current assets minus the change in current liabilities excluding the current portion of long-term debt, minus depreciation and amortization, scaled by lagged total assets.

$\Delta SALES_{it}$  = change in sales scaled by lagged total assets.

$ASSETS_{it-1}$  = total assets

$PPE_{it}$  = net property, plant and equipment scaled by  $ASSETS_{it-1}$ .

$ROA_{it(or\ it-1)}$  = return on assets

#### **Dechow et al., 2012**

Dechow et al. (2012) introduce a new method for detecting accrual-based earnings management, with this method built on the assumption that, in any period, accrual-based earnings management would reverse during another period. Furthermore, the view is also claimed by the scholars that, if the academics have priors in regard to the reversal timing, encompassing such priors could ultimately enhance the ability and the criteria of tests in

the context of earnings management. Their findings suggest that the involvement of reversals could enhance test power by as much as 40%, and may also deliver a sound approach to avoiding model misspecifications that stem from related omitted variables. In some regard, this approach depends on the previous models to decompose accruals into non-discretionary and discretionary elements; on the other hand, however, they also encompass earnings management reversals within these models and analyse improvements. Nevertheless, there has been some criticism directed towards this model in regard to its failure to highlight the way in which the investigator can establish or outline priors for the periods during which there has been the occurrence and reversal of accruals-based earnings management. Rather, their method adopts the view that the scholar recognises the periods during which there will be the occurrence and reversal of earnings management (Gerakos, 2012).

## 2. SPECIFIC ACCRUALS APPROACH

In contrast with the total accruals models, one key element of this approach is modelling particular accruals' behaviours in an attempt to identify its non-discretionary and discretionary aspects. This method commonly directs attention towards a particular sector environment where an individual accrual is sizeable and demands significant judgement. It determines earnings management from examining management discretions through an individual accrual account, namely the claim loss reserve, for example, which is a very material accrual for the insurance sector. Moreover, loan provisions are a particular accrual requiring significant judgement within the banking arena, or bad debt provision and depreciation predictions in an alternative setting. In line with such elements, in addition to subjective proof, the investigators may consider that, through a specific accrual or set of accruals, management discretion may be reflected. The section following provides a prior literature linked with this method.

### **McNichols and Wilson (1988)**

The research by McNichols and Wilson is the first to utilise the specific accruals model to analyse whether or not management manage earnings, with attention directed towards a single accrual, namely bad debts provision, as opposed to a number of accruals. Moreover, it also implements the GAAP framework in order to examine the way in which a specific accounting number, bad debts provision, would be seen when there is a lack of earnings management. In actuality, the research utilises the residual provision for bad debts as proxy for earnings management. In order to calculate this residual, the authors model the expected provision for bad debt as a linear function of the beginning balance in the allowance for bad debts and the magnitude of current and next year's write offs. Through ensuring the control of such elements, the view is made that their method removes the non-discretionary aspects of bad debts expense, and thus gathers a bad debt provision, which mainly highlights accounting discretion amongst management. Accordingly, the model is as follows (McNichols & Wilson, 1988):

$$\text{Prov } t = \alpha_0 + \alpha_1 \text{ BgBl } t + \alpha_2 \text{ Write-off } t + \alpha_3 \text{ Write-off } t+1 + \text{resprov } t$$

where:

Prov t: the provision for bad debts, deflated by period t sales

BgBl t: the beginning balance of allowance for bad debts in period t, deflated by period t sales.

Write-off  $t$ : write-offs for period  $t$ , deflated by period  $t$  sales.

Write-off  $t+1$ : write-offs for period  $t+1$ , deflated by period  $t$  sales.

resprov  $t$ : the projection error, which by design is orthogonal to the regressors.

It can be seen that this model is similar to total accruals models in terms of decomposing total accruals into managed and unmanaged components. To do so it uses regression model.

### **Beneish (1997)**

Beneish (1997) introduces a model centred on identifying earnings management from organisations dealing with significant financial performance, and examines actual earnings management occurrences, contrasting the performance of the model to that of the aggregate accrual approaches, particularly the modified Jones by Dechow et al. (1995). The method establishes a distinction between GAAP violators and aggressive accruals, and is centred on the explanatory variables able to capture and differentiate between elements that establish incentives to violate, and the likelihood of identifying GAAP violation. Moreover, they utilise a number of different possible variables that establish incentives to violate GAAP, and further take into account another eight financial statement variables, which could impact the overall likelihood of being identified by the market participants, with such variables capturing misrepresentations in financial data, as derived through GAAP violation. This delivers a probability prediction of the potential for earnings management between organisations in which abnormal accruals are not correctly outlined. The model is detailed as follows:

$$M_i = Bx_i + \Theta$$

where:

$M$ : a dichotomous variable which takes a value of 1 for violators and 0 otherwise.

$X$ : the matrix of explanatory variables.

$\Theta$ : a vector of mean zero independent and identically normally distributed residuals.

As such, Beneish (1997) highlights that the capacity of the modified Jones model to separate discretion among firms with significant performance may be improved through incorporating lagged total accruals and a tool for measuring past price performance as explanatory. Such additional variables are in line with the estimation made by Guay, Kothari and Watts (1996), who suggest that accruals models that consider the incentives of management and who acknowledge the reversals of discretionary accruals are more likely to detect discretionary accruals.

### **Cecchini, Jackson and Liu (2012)**

The study of Cecchini et al. (2012) examines whether or not the IPO (initial public offering) organisations manage earnings through the application of an individual accrual account on the balance sheet and an individual accrual account on the income statement, notably the allowance for uncollectible accounts and bad debt expense, respectively. Comparable to the approach of Teoh, Wong and Rao (1998), the writers begin through drawing a comparison with the scaled allowance of non-IPO organisations to the scaled allowance of IPO organisations, where the scaled allowances receivables are introduced in terms of percentage form  $ALL_{it} / GAR_{it}$ .

Where:  $ALL_{it}$  is the allowance for uncollectible accounts.

$GAR_{it}$  is a gross accounts receivable,  $i$  and  $t$  are firm and year subscript

The study of Cecchini et al. (2012) further develops such an analysis by placing emphasis on the ratio of the receivables allowance to leading write-offs. The ratio is expressed through the percentage  $ALL_{it}/WO_{it}$

where:  $ALL_{it}$  the allowance for uncollectible accounts.

$WO_{it}$  Write-offs of uncollectible accounts,  $i$  and  $t$  are firm and year subscript.

Making the assumption that leading write-offs is mainly linked with the receivables allowance in year  $t$ , the ratio of 1 should suggest that the allowance is precisely adequate. Ratios seen to be more than 1 would suggest that the organisation has exaggerated its allowance, whereas the organisation may have understated its allowance if the ratio is much below 1. In terms of the examinations of bad debt expense, the work of Cecchini et al. (2012) examined the differences in the scaled bad debt expense between IPO firms and matched non-IPO firms through the application of scales as a scaling variable. This can be illustrated in the following way:  $BDE_{it}/SALE_{it}$ .

where  $BDE_{it}$  is the bad debt expense  $SALE_{it}$  is the net sales and  $i$  and  $t$  are firm and year subscript.

The findings suggest that there is no notable difference when comparing the non-IPO and the IPO organisations. This finding somewhat challenges the view those IPO businesses understate their receivables-related accrual accounts. Moreover, Cecchini et al. (2012) apply the model presented by McNichols and Wilson (1988) with the aim to examine whether or not bad debt expense is seen to be much different between non-IPO and matched IPO organisations following the controlling for economic determinants of bad debt expense. This model is detailed as shown below:

$$\frac{BDE_{it}}{SALE_{it}} = \beta_0 + \beta_1 \frac{ALL_{it-1}}{SALE_{it}} + \beta_2 \frac{WO_{it}}{SALE_{it}} + \beta_3 \frac{WO_{it+1}}{SALE_{it}} + \beta_4 IPO_{it} + \varepsilon_{it}$$

where:  $BDE_{it}$ ,  $SALE_{it}$ ,  $ALL_{it-1}$  and  $WO_{it}$ , are defined above;  $IPO_{it}$  is an indicator variable coded as 1 for IPO firms and 0 otherwise.

The coefficient on  $\frac{ALL_{it-1}}{SALE_{it}}$  can be communicated as negative, where the coefficients on  $\frac{WO_{it}}{SALE_{it}}$  and  $\frac{WO_{it+1}}{SALE_{it}}$  are expected to be positive. Markedly, a positive coefficient on  $IPO_{it}$  suggests that IPO organisations detail greater bad debt expenses than matched non-IPO firms, whilst a negative coefficient on  $IPO_{it}$  suggests that IPO organisations detail more minor bad debt expense than matched non-IPO organisations.

### 3. STATISTICAL DISTRIBUTION APPROACH

This method is centred on the assumption that management commonly have incentives driving them to satisfy particular benchmarks and goals; thus, earnings distribution encompasses lesser observations than expected just below the threshold, with more observations than expected above the threshold. Upon the analysis of the frequency and dissemination of reported earnings surrounding such thresholds, distribution discontinuities may be observed. Importantly, if the distribution is balanced, no earnings management is adopted; on the other hand, however, if earnings are recognised at a particular benchmark or at 0, earnings management may have been implemented. Nevertheless, earnings distribution in itself is not adequate; there needs to be particular thresholds that seek out and establish the

discontinuity apparent at such thresholds. The following section considers the most commonly cited researches linked with this method.

#### **Burgstahler and Dichev (1997)**

The study of Burgstahler and Dichev (1997) delivers the first cross-sectional distribution method in order to analyse whether, why and how organisations achieve earnings management. This study establishes three thresholds that drive the manipulation of earnings. These are: to avoid reporting earnings decreases, to maintain positive earnings and to avoid losses. This research centres on the view that earnings management with the aim of avoiding decreases in earnings is likely to be highlighted through cross-sectional distributions of earnings changes. Such distribution takes the form of uncommonly high frequencies of minor earnings increases and uncommonly low frequencies of minor earnings decreases. In much the same way, earnings manipulation to avoid losses will be highlighted through the form of unusual high frequencies of minor positive earnings and unusual low frequencies of minor losses.

With the aim of examining this assumption, two different forms of evidence are utilised, the first of which is graphical through the adoption of histograms in order to epitomise the pooled cross-sectional earnings data gathered, and to further emphasise the changes in earnings around zero and the lack of continuity of earnings; the second test is statistical in nature, and adopts the assumption that, within the null hypothesis of no earnings management, it is considered that there would be a smooth cross-sectional dissemination of earnings changes and earnings levels. From an operational standpoint, smoothness, in this context, is described as being the number of observations expected during any distribution period. This expected number is collocated as the average of the numerous observations in the two intervals immediately closest.

#### **Degeorge et al. (1999)**

Degeorge, Patel and Zeckhauser (1999) presented a method centred on behavioural thresholds for earnings management; with this particular model demonstrating the way in which efforts to surpass thresholds create certain earnings management patterns. The process begins with the establishment of three thresholds, each of which is considered a probable earnings management driver. The first of these is centred on reporting profits, which stems from the psychological value recognised in terms of the distinction between negative and positive results. The second is maintaining recent performance; in other words, to earn at least the same as the previous year. The third is to meet the expectations of analysts, especially the consensus of analysts in their earnings predictions.

Such thresholds are recognised as fundamental for management owing to the fact that the parties in question, along with the organisation, also view them as valuable. The model assumes that executives perform earnings management with the aim of impacting the views of outsiders, including banks, investors and suppliers, with the aim of deriving personal satisfaction from making a target. At the same time, outsiders make use of thresholds as a way of rewards and assessing executives; in this regard, upon the response of executives to such thresholds, reported earnings distribution becomes unclear. Essentially, too many earnings fall above the threshold whilst too few fall below. The assumption is also made that, when earnings are recognised as being within an unacceptable range, upwards management incentives are notable. Furthermore, if bonus plans limits are exceeded by earnings, limits will be moved, thus meaning future limits will be easier to achieve.

**Gore et al. (2007)**

The study of Gore, Pope and Singh (2007) adds additional value to the literature in two key ways. Primarily, it examines a wide-ranging non-American dataset, which has not been done before, thus validating the belief that those discontinuities reported in the literature previously are not particular to the US environment. Secondly, it further presents innovative tests, providing further support to the idea that the discontinuities in the distribution of earnings are linked with accruals centred on earnings management within their particular sample. Moreover, it also examines the links and associations between working capital accrual discretionary components, earnings target achievement frequency and the discontinuity observed in the distribution of earnings alongside basic targets. The scholars also implemented an in-depth assessment of earnings management in regard to earnings thresholds with the use of a significant sample of organisations in the United Kingdom. Emphasis was placed on earnings management with the inclusion of working capital accruals manipulation. Evidence was detailed as being consistent with earnings management with the aim of achieving goals. More specifically, they highlight that earnings adjustment for discretionary accruals eradicates earnings target discontinuity.

**4. DISCUSSION OF DEVELOPING AND EVALUATING THE DIFFERENT APPROACHES**

Despite the fact that all discretionary accruals models share the common concept—utilising non-discretionary accruals as a measure for earnings management—it remains that there are fundamental differences between the models. Particularly in regard to separating the non-discretionary accruals aspect from the total accruals, and their capacity to deal with changes in organisations' economic circumstances, in addition to the power and specification of each model. The models provided by Healy (1985) and DeAngelo (1986) hold the assumption that there is stability amongst non-discretionary accruals, with such limits recognised as unrealistic owing to the fact that accounting accruals experience change in line with the economic environment (Kaplan, 1985, cited by Dechow et al., 2012). As a substitute to the model provided by Jones (1991), the amended version by Dechow et al. (1995), in addition to the performance-adjusted discretionary accruals presented by Kothari et al. (2005), the variations of non-discretionary accruals are controlled through consideration to the changes in total assets, receivables and revenues, in addition to the performance of the organization (e.g. return on assets).

In terms of the power and specification of all models, the original and modified version of the model of Jones are acknowledged throughout the literature as being the most capable tools in terms of identifying earnings management (Dechow et al., 1995; Young, 1999). A number of researches conducted recently provided a comparison of the performance of alternative total accruals models in identifying earnings management. For instance, Dechow et al. (1995) and Guay et al. (1996) assess the overall performance of five deferent models with the aim of measuring discretionary accruals, in particular those of Healy (1985), DeAngelo (1986), Jones (1991) and Dechow & Sloan (1991), as well as the model suggested in their research—the amended Jones model. The findings suggest that the amended Jones model displays the greatest ability in terms of testing earnings management. Moreover, literature published previously, such as the works of Subramanyam (1996) and Peasnell et al. (2000) all emphasise highlight the superiority associated with adopting the Jones model in regard to cross-sectional data over their time-series counterparts.

This is owing to the fact that the former decreases time effect issues and creates a larger sample, thus inducing a greater coefficients estimate.

The main benefit associated with this method is its capacity to capture the scale of earnings management; in contrast, however, it is not able to highlight the accounts utilised by management. One further matter for consideration is the aggregate accruals models, which utilises residuals in order to calculate the discretionary accruals. In the time-series scenario it is recognised that residuals use is suitable, measuring the difference between abnormal and normal accruals throughout the estimation and event periods, respectively; on cross-sectional settings, on the other hand, this is not the same case. In theory, residuals should average zero, thus meaning that the model's specifications are significantly queried when measuring discretionary accruals.

In relation to specific accruals methods, seeking to identify earnings management through the use of single accruals can be both beneficial and disadvantageous, with three pros and cons highlighted by McNichols (2000) as linked with this particular accruals approach. The main benefit is, firstly, the fact that intuition may be used by the researcher for the main elements impacting the accrual behaviour, with knowledge of generally accepted accounting principles exploited; secondly, a particular accrual method may be adopted across those sectors where business practices cause the accrual to be a likely object of discretion and judgment; and thirdly, the direct estimation of the link between the explanatory factors and single accrual factors.

In contrast, there are three key drawbacks: primarily, there may be the identification of earnings management within a single accrual approach, but only if the accruals under analysis are managed, thus meaning there are problems associated with establishing those accruals utilised for earnings management. Importantly, even if the most suitable accrual is analysed, the impacts of managing an accrual alone may not be significant enough to achieve statistical significance. It is claimed by McNichols and Wilson (1988) that, upon specific accruals representing a small aspect of the discretionary component, they may not be successful in highlighting earnings management in instances where other discretionary elements have been manipulated. In this way, the aggregate accruals models may introduce a more in-depth study design when capturing the discretionary elements. Secondly, it is reasonable to suggest that management utilises more than one accrual during the process of earnings management; therefore, although the single accrual approach is efficient in terms of identifying the management of earnings in some cases, earnings management in most situations cannot be identified (McNichols and Wilson, 1988). Thirdly, the numerous organisations for which a particular accrual is managed could have a small relative to the number of organizations with aggregate accruals, which could ultimately restrict the generality and understanding of the results concerning particular accruals researches.

Regarding the distribution approach, its key feature is being relatively simple to use, and it is a graphical description of the earnings after the alteration of reported earnings has accrued. In addition, this approach detects earnings management while avoiding the issue of measurement error and misspecification resulting from accrual-based earnings management models (Sun and Rath, 2010). McNichols (2000) states that the distribution models are powerful in earnings management investigations, because they provide the researchers with a strong prediction based in the frequency of earnings realizations rather than the estimation of the discretionary accrual. Moreover, it is considered a suitable powerful method for measuring earnings management when an enormous number of firms sceptic to be managing earnings. However, the results of empirical studies that

question the shapes of earnings distributions as evidence for absence / presence of earnings management do not support the assumption that earnings management can be completely explained by the discontinuity of the earnings distribution. For example, Dechow, Richardson and Tuna (2003) do not find an association between discretionary operating accruals and the earnings discontinuity. Also Durtschi and Easton (2005) provide results that should be taken in consideration when using the shapes of the frequency distributions of earnings as indicator for earnings management practices. They show that these shapes can be affected by deflation, sample selection, and a difference between the characteristics of profit and loss observations (such as market pricing and analyst optimism/pessimism). The same findings established by Beaver, McNichols and Nelson (2007), Durtschi and Easton (2009) who emphasize that researchers should consider evidence beyond the shapes of distribution and should be caution when interpreting a discontinuity in the distribution of earnings as indicator for earnings management. In contrary to these studies which questioned distribution approach for earnings management measurement, Jacob and Jorgensen (2007) reexamine the findings of Burgstahler and Dichev (1997) and support the findings in Burgstahler and Dichev (1997) and indicate that these findings are not induced by scaling. Above of all, it can be seen that this approach can indicate earnings management practice existence but delivers no insight into the techniques or magnitude of earnings management.

Overall, the various methods available for identifying the management of earnings are numerous, with the benefits of all methods seemingly reliant on their overall capability in terms of measuring earnings management level and methods. Accordingly, establishing which method is most suitable ultimately rests on the aim of the study: if the study is concerned with analysing the degree of earnings management with lesser attention directed towards the approaches, the aggregate method would be viewed as most suitable. The specific accruals approach is more suitable if the objective is to test whether particular approaches have been adopted in order to manage earnings; however, the results of particular accruals can be problematic to generalise when particular accruals are not very sensitive. In contrast, the method of distribution frequency is valuable when testing for the present management of earnings, although it is not able to detect the degree or the instruments associated with the changes in the earnings reported.

#### CONCLUSION

The measurement of earnings management is a common consideration amongst professionals and academics in the field; however, owing to the fact that these practices cannot be observed directly, as well as the numerous methods management adopt in its application, identification is problematic. Accounting literature does provide a number of different approaches for the measurement of earnings management; however, their abilities remain questionable, with all methods comprising benefits and drawbacks in comparison to others, which need to be acknowledged by academics when identifying earnings management. In actuality, the pros and cons of all methods ultimately depend on their ability to measure the level and instruments of amending the earnings reported. Furthermore, aggregate accruals approach are recognised as being the most widely utilised and capable, particularly the original devised by Jones, the subsequent modified model of Jones, and the performance model. The ability is derived from its capacity to control organisational

performance when separating total accruals into non-discretionary and discretionary accruals, and subsequently utilising the former as a proxy for earnings management. Researchers should consider such approaches, which are able to highlight the level of earnings management without detailing the approaches applied. The specific accruals method is not only able to measure the management of earnings in regard to the level, but also has the ability to identify the tools implemented. Nevertheless, the results of such a method are problematic in terms of generalisation when particular accruals are not adequately sensitive. In relation to the frequency distribution method, this can be adopted simply and avoids measurement error that can arise with the implementation of different methods. Nevertheless, it may be utilised with the aim of identifying whether or not there is the presence of earnings management, but delivers no insight into the instruments or magnitude of earnings management.

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## **PRIKAZ PRISTUPA IDENTIFIKOVANJA NIVOA UPRAVLJANJA DOBITKOM: RAZVOJ I EVALUACIJA**

*Praksa upravljanja dobitkom izazvala je značajnu pažnju te postala predmet interesovanja regulatornih tela, praktičara i naučne javnosti. U literaturi iz oblasti računovodstva, navode se tri ključna pristupa za identifikovanje nivoa i tehnika upravljanja dobitkom. U pitanju su pristup zasnovan na ukupnoj razlici između operativnog cash flow-a i dobitka, pristup zasnovan na specifičnim razlikama i statistički pristup zasnovan na distribuciji raspodela. Uprkos činjenici da su brojna istraživanja usmerena ka poboljšanju svakog od navedenih pristupa, ograničenja su i dalje prisutna, te svaki pristup ima svoje prednosti i slabosti. U radu je dat kritički osvrt metoda za ocenu nivoa upravljanja dobitkom prisutnih u literaturi, uključujući i prikaz razvoja ovih metoda, uz naglašavanje prednosti i ograničenja koje je u istraživanjima usmerenih ka identifikovanju upravljanja dobitkom potrebno uzeti u obzir.*

**Ključne reči:** *upravljanje dobitkom, kvantifikovanje upravljanja dobitkom, pristup zasnovan na razlici između cash flow-a i dobitka, disruptivni pristup, pristup zasnovan na distribuciji raspodela.*