

A Literature Review on Evolving Earnings Management Techniques

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Abstract

Earnings management is a wide area of concern. The critical nature of the subject has garnered significant focus of academicians and practitioners. Over the years, several research articles have comprehensively examined the state of earnings management, various models used, and the scope of the study. These studies have focused on the understanding of earnings management, various models employed in the detection and prediction of earnings management, and the future areas of the study. The present paper is a summary of the recent research studies conducted in the area of earnings management techniques between the years 2009-2015. The paper reviewed the existing research articles that discussed new methods and existing methods on detecting earnings management that added a new perspective in detecting earnings management. The research studies employed several new techniques and models along with the use of variables, which can be used to gain significant information on indicating the presence of earnings management. The use of accounting ratios, neural network, and cash flow from operations are some of the examples that the researchers have used, giving altogether a new approach towards diagnosing earnings management.

Keywords : earning management, techniques, accruals and reversal, qualitative and quantitative techniques

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Earnings management is not a new phenomenon. The existence of such practices has been right from the time of existence of business. In the recent times, it has emerged as one of the greatest challenges of the current business scenario. The cost of ignoring such crucial information has already resulted in two hard hitting recessions; one in Asia (1997) and the subprime crisis (2007; originated in USA and later affected almost the entire world). The effect of the sub-prime crisis has still not receded, and several countries are still trying to recover from the shock. This has led to increased attention towards the area of study worldwide.

More and more countries are trying to devise better policies to curtail such harmful practices. Better corporate governance laws are being framed and enforced. Vigilance is being improved. Therefore, it becomes inevitable for the accounting professionals and academicians to understand and figure out ways in which these accounting figures could be detected in the initial stage. There are various accrual models, which have been used till date to detect earnings management, the modified Jones model being the prominent one. Apart from the Benneish M-score and the Jones Model, the present paper tries to bring out the new research studies done to detect earnings management. Even M-score has not been as popular as accrual models. Therefore, this paper is

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an attempt to highlight the new techniques in the area of earnings management. The paper considers the period from 2009 to 2015, and tries to summarize the new techniques used in the papers and their findings. While some of the papers have used variation of the accrual model, the employment of neural network and development of algorithms show a lot of scope for future research in the improvement in the process of detecting earnings management.

Objective and Motivation of the Study

The paper aims to highlight the recent advancement in the field of evolving techniques of earnings management. The paper has considered latest studies, which are different from accrual methods of detecting earnings management such as neural network. There have been various popular studies on the review of earnings management. Healey and Whalen (1999) provided a comprehensive summary of almost all empirical papers on earnings management and their implication on standard settings. The study also highlighted some important areas on the future scope of study on earnings management. Although the study, in particular, did not review the techniques, but it also presented some of the important papers which focused on the reliability of accrual models in predicting earnings management.

Other important review studies done by Dechow, Ge, and Schrand (2010) and DeFond (2010) reviewed articles on earnings quality. The paper threw light on the reason for growth in the field of study of earnings management and the models that are being employed. The paper concluded that one of the important challenges in the field of study is the abnormal accrual model that has a limitation in predicting earnings management. Both of these papers considered all relevant studies in the area of earnings management and are classified. This review only focuses on the studies which have thrown light on the development of new techniques. Furthermore, the period that this study has considered has not been considered by any other review study.

Content analysis was employed to review the articles. The journal articles used in the study have been taken from various databases such as Elsevier/Science Direct, Emerald, Ebscohost, and Proquest. The period of the study is from 2009-2015.

Definitions of Earnings Management

According to Healey and Whalen (1999) :

Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers. (p.368)

Schipper (1989) defined earnings management as the “purposeful intervention in the external financial reporting process with the intent of private gains” (p.92). There is an alternate definition given by Arthur Levitt, former Chairman, SEC (1998) where he defined earnings management as a gray area where accounting is being perverted; where managers are cutting corners; and where earnings reports reflect the desires of management rather than the underlying financial performance of a company.

Discussion of Various Techniques

Chen, Chi, and Wang (2015) discussed the complexities involved in the biotech industry in financial statement

analysis, and detection of earnings management was the central focus of the research paper. The adoption of data mining techniques also resulted in better detection of accounting manipulation. This study examined the earnings manipulation state in biotechnology by incorporating computing models. Various methods for screening earnings management variables were employed such as the principal component analysis (PCA) and Bayesian network (BN). It also employed constructing the integrated model with the back propagation neural network (BPN) and C5.0 (decision tree) to identify whether the organization seriously engaged in manipulative practices. The decision tree is a tool for decision making that uses a tree-like model or a flow chart to analyze every aspect of decision making such as cost, outcomes, and so forth. A neural network is a method of information processing, which stimulates bio-neural networks. The techniques employ a huge number of connected artificial neurons to simulate the capacity of bio-neural networks. The results pointed out that the combination of the BN screening method with C5.0 yields maximum performance with an accuracy rate of 98.51%. It was also found that an organization's previous period discretionary accruals were crucial in affecting the extent of accrual earnings management.

Bereskin, Kieschnick, and Wendy (2014) examined U.S. firms for a period from 1990-2012. The study examined the effect of operating environment on the earnings management. Both accruals based and real earnings management were taken into consideration. The study also investigated what were the popular methods of managing earnings. The causes of changes were also analyzed. It also calculated the effect on earnings management with a change in tax rate, regulation, and economic conditions. It was also concluded that executive compensation was significant in affecting earnings management. The associations among diverse methods of earnings management differed over time, and the trend was complex.

Alareeni and Aljuaidi (2014) used two models Modified Jones (1995) and Yoon et al. (2006) in the context of Palestine for investigating earnings management. The study also compared the test of both of these models. The data were all listed companies of Palestine stock exchange for a period from 2006-2011 and a sample of 26 listed industries. The Yoon et al. (2006) model took into account cash sales, cash expenses along with non-cash expenses. Although the paper concluded that Yoon's model was better in the context of Palestine, but the effectiveness of the model was under question. It suggested the development of a better model for earnings management.

Najari, Bishak, Pazhand, and Baygi (2014) argued that most of the recent studies on earnings management have been based on linear relationship between earnings management and independent variables. This paper did not exploit the use of a non-linear relationship that existed between earnings management and independent variables. The paper emphasized that the use of artificial intelligence with artificial neural network can be used to study non-linear correlations between earnings management and variables. The paper exploited the possibility of developing a model with the help of SVM that can predict earnings management. This paper deployed Support Vector Machine (SVM) for predicting a model for earnings management. The Support Vector Machine is an algorithm that uses data to analyze and study patterns used for regression analysis. Discretionary accruals were used as dependent variable, and financial ratios were used as the independent variable. The study used the data of Tehran Stock Exchange from 2004 and 2014. The model proposed in the research had an accuracy of 94.4%.

Hong, Huseynov, and Zhang (2014) employed a simultaneous equation system to evaluate the relation between analyst following and earnings management. The paper concluded that managing earnings are a joint decision of analyst followings and managerial decisions. The paper used over 4900 firm year observations, and the time span was from 1990-2010. The paper found that analysts had better following for firms which did not have high levels of earnings management as information availability is simple in these firms. It also stated that analyst following acts as a control factor over management and it tends to reduce levels of real and accrual based earnings.

In their paper, Naidu and Patel (2013) compared qualitative and quantitative methods of detecting earnings

management in a Fijian enterprise. The models used were: performance-matched discretionary accrual model, which is a quantitative approach and for quality approach, the Mulford and Comiskey (2002) model was employed. The Mulford and Comiskey model integrates additional forms of earnings management, which includes classification shifting along with real activity management. The time span was from 1989 to 2009. The findings were that none of the model was found to be superior in detecting earnings management.

Charfeddine, Riahi, and Omri's (2013) paper focused on the key factors that can be used to determine earnings management in emerging countries. The paper considered 19 listed companies from the Tunisian stock exchange for a time span of 2003-2009. The analysis was conducted by separating the factors into two principal groups-incentive group and constraint group. For measuring the discretionary accruals, the paper employed three models, Dechow et al. (1995) (modified Jones model), Kothari et al. (2005), and Raman and Shahrur (2008). The residuals obtained from these tests were regressed on a set of explanatory variables. The hypothesis tested the impact of these variables on earnings management. The findings revealed that the residuals obtained depended on the model employed. The paper employed nine variables and considered six to be significant in determining earnings management.

Song, Lee, and Cho (2013) tried to establish a link between the earnings management instance with the amount of misappropriated assets. It also tried to see whether earnings management was associated with fraud. The background of the study were Korean firms which announced asset misappropriation. A total of 173 sample firms were taken and the time period was from 2006-2010. The tools used were logistic and linear regressions. Discretionary accruals were used for measuring earnings management. The study also used robustness test using estimated accruals as a supplementary proxy of the earnings management. The result suggested that there was a positive association between assets misappropriation and discretionary accruals, that too specifically with firms that had negative discretionary accruals. The study is a pioneering one as unlike other studies where asset misappropriation was linked with corporate governance, it linked it with discretionary accruals.

Fok and Franses (2013) discussed the pattern of earnings management. Earnings management to evade earnings reductions and losses follows time-series properties. The trends are that the incomes of the last quarter in the fiscal year fluctuate from those of the other three quarters. The tool employed a simple parametric methodology to identify the differences; 390 firms were taken from compustat. The paper concluded that simple periodic time-series, which was employed on the sample acted as a strong tool of detecting earnings management.

Höglund (2012) introduced a new approach towards the estimation of earnings management. Considering the extant literature available which used discretionary accrual as a proxy for earnings management, he proposed neural network methods, as the discretionary accrual methods have faced a lot of criticism on the accuracy of their estimation. He explained that most discretionary accruals were not accurate as they assumed a linear approach for modeling, which does not hold true in every case. He introduced a substitute method to remove the problem of non-linearity. This approach was to employ various types of neural networks. The paper tried to use neural network-based models to prove that they were superior to linear-based models for the estimation of earnings management. The study employed neural network models, which were based on a self-organizing map (SOM), a multilayer perceptron (MLP), and a general regression neural network (GRNN). The paper concluded that the best model for estimation had been GRNN-based model ; whereas, linear models were very weak.

Jansen, Ramnath, and Yohn's (2012) research focused on a new technique of identifying earnings management using two popular ratios. The ratios used were asset turnover (ATO) and profit margin (PM) under the assumption that in normal economics, ATO and PM are compelled to move in opposite directions, provided firms are managing earnings. The paper hypothesized that coexistent rise in PM and fall in ATO is an indication of upward earnings management. The paper concluded that ATO/PM diagnostic is relatively superior to performance-adjusted abnormal accruals in signaling out that firms engage in earnings management.

Dechow, Hutton, Kim, and Sloan (2012) (this paper is one of the most cited papers) employed a novel way to check for accrual-based earnings management by using reversal. The paper said that earnings management of 1 year reverses in another time period. If the timing of reversal is known, this can considerably increase the power of the test. The results concluded that giving due consideration to the reversal can improve the power of the test by 40%. This yielded a robust explanation for moderating model misspecification, which occurs due to correlated omitted variables.

Gerakos (2012) discussed Dechow, Hutton, Kim, and Sloan's (DHKS) technique of detecting earnings management, which is based on reversal. The paper evaluated the DHKS technique and its usefulness. The DHKS method is based on deterministic methods. The paper concluded that this technique is better than other accrual detection methods. The paper detailed various aspects of error detection (type 1 and type 2 error rate) and reversal management in a great detail.

Beatrice and Dacian (2011) highlighted a recommendation on refining the mechanism of detecting manipulation of accounts. Numerous empirical studies were scrutinized to develop a sturdy model for making the detection of accounts manipulation easy. Since earnings management distorts the quality of accounting information, the method to estimate a precise process is complex. Therefore, the paper proposed a new field of research by emphasizing various aspects of accounting manipulations. The paper suggested that regulating the circumstances and motivations tend to surge the probability of its occurrence and also evolve sturdier tools for detecting manipulation.

Jordan and Clark (2011) examined cosmetic earnings, which is a management's deliberate attempt to boost earnings. The above studies tested for the presence of earnings management with the help of Benford law. The study selected publicly traded companies with positive income from compustat for the time period of 1997-2000. The analysis of pattern of distribution of numbers was studied. In the number 3,965, the first digit is three, nine as the second digit, and so on. Earnings were worked upward to rise the first digit by one, the lower than estimated frequency of high. The study found concrete evidence that Benford law can be used in studying the presence of earnings management.

Baber, Kang, and Li (2011) analyzed reversal trends in detecting earnings management. The study examined both empirical and conceptual analysis of discretionary accruals. It stated that income increasing accrual of one period became income decreasing reversal for the next period. For demonstrating the empirical implication, the study used reversal speed as an added factor of the balance sheet for earnings management. The paper concluded that given the magnitude of overstatement of net operating assets, the reversal speed and probability of obtaining the earnings forecast had an inverse relationship.

Dikmen and Küçükkocaoğlu (2010) aimed at developing an algorithm with the help of mathematical model which would help in detecting earnings management accurately. The method employed was the use of cutting plane formulation using mathematical programming. The data size was of 126 manufacturing firms of Turkey. It used 10 financial ratios to investigate manipulative practices. The results indicated that three-phase cutting plane algorithm was far better than other statistical tools.

Das, Shroff, and Zhang (2009) examined that the pattern of quarterly earnings changes served as a sign of earnings management. The hypothesis was underperforming firms in interim quarters might attempt to surge earnings of the fourth quarter. This was done to attain the expected annual earnings target. In contrast, firms with good performance try to cut earnings of the fourth quarter in an attempt to form "reserves" for the future. The results brought out interesting findings that on an average, one-fourth of the sample of firms that tend to achieve or overperform their targets are endeavoring to even yearly earnings by managing earnings downward in the fourth quarter. The paper also concluded that firms reporting earnings by reversal did not enjoy good creditability in the capital markets.

Managerial Implications

The paper made an attempt to review papers, which have a new insight in detecting earnings management. Some of the relatively new and lesser-known techniques that have been discussed in this review include: principal component analysis (PCA) and Bayesian network (BN), neural network methods, qualitative and quantitative methods of detecting earnings management, and also the use of ratios. These techniques can be employed in different business scenarios for better prediction of earnings management.

The paper tried to bring together a comprehensive literature on the development of new techniques for detection of earnings management. There have been only two popular and widely practiced techniques : accruals model and Bennis M-score. Although these two models are very prevalent techniques for detection of earnings management, but these two models are not fit for all types of economies and suffer from some limitations. The paper aimed to throw light on the new techniques of detection, which can be employed by managers to test for earnings management.

Limitations of the Study and Scope for Further Research

The paper is a review study. It has made a review on the evolving techniques for detection of earnings management. The effectiveness of these measures cannot be commented upon as it can only be ascertained if the new techniques are used in practical businesses. The accounting policies involve different complexities depending on the size of the business and the economic environment where the business functions. It is really difficult to establish a standard method which could be employed everywhere to detect earnings management. However, efforts are being made to establish an international accounting standard and the adaptation so that the complexities could be minimized and a standard way accounting practices can be implemented. This would substantially induce fair practices and reduce the instance of earnings management. Efforts are also made in developing such models, which could detect earnings management to suit every business environment. The models that are used also need to be modified as per the changing needs of businesses. Accrual models, although are popular choices, but they suffer from their own limitations. The present review discusses new techniques and also finds scope in the improvement of techniques of detecting earnings management, which could fit all types of economies, especially for developing economies like India.

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