XBRL Reporting: The impact upon the Assurance Industry

ACC 652 Term Paper

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For: Prof Kieng Iv
Contents

Introduction .......................................................................................................................................................... 1
Functionality and Goal of XBRL ....................................................................................................................... 2
Implications on the Continuous Audit .............................................................................................................. 3
Implications on Financial Statement Fraud Detection ....................................................................................... 7
Going forward with XBRL – Expansion of assurance requirements ............................................................. 10
Conclusion .......................................................................................................................................................... 11
Introduction

eXtensible Business Reporting Language (XBRL) is a developing technology used to enhance financial statements. Financial information originally contained within a normal .doc or .pdf document is converted into a computer file consisting of XBRL codes. Each piece of financial data is tagged with a code and amount. In essence, the process recreates the financials with one key difference - the subsequent document can be read and broken apart by automated programs. In theory, this opens the door for extensive analytical procedures that wouldn’t be possible with paper filings.

While XBRL reporting represents a fundamental shift in the reporting environment, the true extent of its impact is yet unknown. This report will attempt to both assess the impact of XBRL reporting in the assurance sector. As professionals directly involved in the assurance sector, this developing technology directly impacts a firm’s obligations to the users of financial data. In determining the impact of XBRL, this report will focus upon two specific areas – continuous auditing and fraud detection. These two facets of the reporting environment have been focused upon as they are critical areas in which increased analytical power would have a considerable difference. In addition, the use of these two areas provides two lenses through which to analyze the assurance issues that XBRL reporting raises – the preparation-side benefit and the regulatory-side benefit.

This report will then be structured in the following manner. A brief history and understanding of XBRL will first be established, focusing upon developing a working knowledge of XBRL. The concept of a continuous audit will then be explored, followed by an analysis as to how XBRL reporting may alleviate some of the challenges in performing the audit. The paper will continue with an analysis as to the implications of XBRL on fraud detection, with a specific focus on data mining techniques. This paper will then conclude with a statement of general implications of XBRL going forward and the extent to which XBRL reporting has altered the assurance environment.

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1 Assurance on XBRL for Financial Reporting; Page 2
2 Does it add up? Early Evidence on the data quality of XBRL filings to the SEC, Page 3
Functionality and Goal of XBRL

XBRL was initially derived from a similar language known as eXtensible Markup Language (XML) and has experienced an increasing importance in the value-chain of information delivery – to the extent that some have termed it the “digital language of business”\(^3\). While the technology that XBRL was based on has been in existence since the development of the internet, SEC regulations have initiated a key paradigm shift\(^4\). Mandated by the SEC as a part of the mandatory reporting process, corporations issuing filings in the United States are not expected to provide both paper and XBRL filings. With the United States leading the change, it will only be a matter of time before international adoption of XBRL reporting.

The stated goal is to facilitate the “automated production and consumptions of large volumes of business performance information with high degrees of data quality.”\(^5\) XBRL delivers upon this goal through the process of a defined taxonomy, or dictionary, of tags that is referred to by organizations to create XBRL documents that contain all their financial information. Each piece of financial information is attached to its relevant tag per the taxonomy. Through this tagging process, a document is created that both holds all the financial information of the organization, but is also in a format that can be understood by both computer and human users.

As it currently stands, the tagging of financial information requires a substantial initial investment to set up. However, once the initial template has been determined, future iterations only require smaller adjustments as new lines of financial information are added to the statements. Years and amounts can be automatically drawn through the template from internal documents.

The release of information in a computer readable format has extensive implications upon the business reporting environment. It represents a significant change in both the quantity and potential quality of information available to information consumers. Not only are users exposed to a much larger amount of data, this information is available for their manipulation. Before XBRL reporting, information had to be data mined from the paper documents, with varying degrees of success\(^6\), or manually entered into a database. XBRL reporting has allowed users to “incorporate corporate information directly into

\(^3\) XBRL awareness in auditing: A sleeping Giant?, Page 1
\(^4\) Does it add up? Early Evidence on the data quality of XBRL filings to the SEC, Page 3
\(^5\) Does it add up? Early Evidence on the data quality of XBRL filings to the SEC, Page 3
\(^6\) Financial Reporting and Auditing Agent with Net Knowledge and XBRL, Page 13
their data warehouses and decision models.” The implication of this ability is that decision making can occur at a much faster pace with far less human intervention.

**Implications on the Continuous Audit**

The concept of a continuous audit revolves around the performance of auditing procedures during the year. This provides additional assurance as to the financial reports – if the parts are understood to be accurate, the accuracy of the sum of the parts can be logically deduced as well. This reduces the need for post-year end audit procedures. In addition, early detection of discrepancies allows for a problem resolution far earlier in the reporting cycle – before pertinent information is lost or the error becomes prevalent throughout the financials. The direct implication of this is that audited financial information can be released in a far timelier manner. With the successful implementation of continuous audit procedures, firms may be able to implement continuous audits with such efficiency that the frequency of audited disclosures may change from an annual disclosure to a quarterly.7

This push for continuous audit procedures is driven by two primary movements – firstly, developments in technology, and secondly user demands.8 In the increasingly competitive investing environment, users are demanding information on much tighter timelines. While this demand could not be satisfied in an environment where auditors relied primarily upon manual counts and tests, the shift towards a more computer based audit process has expanded the realm of possibility considerably. The importance of timeliness and the technological shifts that have occurred have driven auditors to seek out additional methods to competitively deliver upon this demand.

The wide variety of continuous audit techniques is beyond the scope of this analysis. The important understanding remains that continuous auditing occurs during the financial reporting year. This analysis will focus on the use of embedded audit modules (EAM) into the software that is used by an organization. As software modifications embedded into the host system, the modules automatically and “continuously monitor the flow of transactions, identify transactions that match certain pre-determined integrity constraints and, in the event of a constraint violation, alert the auditor and copy the transaction data to a file.” 9 In essence, it represents the epitome of an automated and continuous audit procedure.

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7 Research Streams in Continuous Audit: A review and Analysis of the Existing Literature, page 1
8 Research Streams in Continuous Audit: A review and Analysis of the Existing Literature, page 2
9 Embedded Audit Modules in Enterprise Resource Planning Systems: Implementation and Functionality, page 2
While studies as early as 1991 have indicated the feasibility of EAM’s in terms of development, implementation and usability, the adoption rates have been limited across industries\(^{10}\). A potential reason for this is that the use of EAMs require additional hardware and software – things that increase the overhead costs of an organization for no operational gain. Studies have attempted to explore other methods of encouraging the adoption of EAMs, including the concept of embedding the modules within ERP systems.

The success of EAM implementation into ERP systems appear to be a given. The use of ERP software is widespread and prevalent throughout industries. The fact that ERP software provides a unified approach to data and process management has resulted in its displacement of traditional separate software suites specializing in the management of one facet of the business process\(^{11}\). Thus ERP software is the perfect place to embed audit modules – all the data is being transferred through the ERP already, so tapping into it for audit purposes should not be an issue.

However, there exists a considerable discrepancy between what is theoretically possible, and the offerings in the industry. The majority of ERP software does not provide substantial support for the modification and inclusion of EAM\(^{12}\). There do not appear to be any indicators that ERP manufacturers have any desire to expand upon their offerings to include EAM support. As there is no information as to support widespread demand for EAM software this situation is unlikely to change. While there exists an opportunity for a third party – perhaps sponsored by the major accounting firms, to step in and develop a method to integrate EAMs, this would entail a significant level of work and raise issues with cross-platform functionality.

Other concerns with EAM embedding into the ERP software is that the information remains in control of the business\(^{13}\). As the EAM are embedded into the ERP software of a business, the implementation and continued integrity of the code falls to the client’s technical staff. This opens up an additional area where significant assurance is required. While it admittedly reduces the burden of substantive testing, it heightens the degree of controls testing required for each client.

Thus, while the concept of EAM is extremely attractive in terms of the benefits and impact that it can make upon the continuous audit process, implementation has stagnated. This is in part due to a lack of vendor support for EAM, but also a lack of widespread demand by assurance providers for EAM

\(^{10}\) Embedded Audit Modules in Enterprise Resource Planning Systems: Implementation and Functionality, page 2
\(^{11}\) Embedded Audit Modules in Enterprise Resource Planning Systems: Implementation and Functionality, page 2
\(^{12}\) Embedded Audit Modules in Enterprise Resource Planning Systems: Implementation and Functionality, page 17
\(^{13}\) Embedded Audit Modules in Enterprise Resource Planning Systems: Implementation and Functionality, page 17
implementation in ERP software. In addition, the process itself may lead to questionable levels of management involvement in the assurance process.

Despite the challenges encountered, the concepts and goals of developing a method to continuously monitor an organization's data remains attractive. This elicits a return to the XBRL perspective discussed prior. Yet, the concepts explored thus far only extend to the use of XBRL in year and quarter end reporting. While this improves timeliness of information to the end-user of financials, it holds no tangible benefit towards the auditor-client relationship.

However, reporting is only the beginning of what is possible with a unified reporting language. The next step can be understood to be the development of a language for use in the GL. Termed XBRL-GL, the concept is to develop a language that works in conjunction with the XBRL-reporting taxonomies. As a part of the greater XBRL family, XBRL-GL has been developed as a language to record daily transactions. The committees responsible for its promotion and development have provided an excellent governing framework as to the goals of XBRL-GL. In summary of their framework, XBRL-GL serves to span the gap between transactions and reporting – it enables the creation of a generic representation of information as it flows into the system.

The relevance of organizations utilizing XBRL to track their transactions to a continuous audit is clear. Whereas the embedding of audit modules into ERP systems was hampered by vendors and their proprietary systems and file types, clients can now export data in a universally readable format. An auditor can thus develop testing templates that can be used to batch analyze exports – potentially on a monthly or even weekly basis. These testing templates would see cross-client use with minor modifications as to the precise constraint violations per client. In addition, the codes and procedures would remain with the auditor, avoiding some of the management conflicts applicable with embedding in ERP software.

In conclusion, the shift towards XBRL reporting renews the potential for implementing continuous audits at client sites. However, it must be recognized that auditors must make a concerted push to encourage the adoption of XBRL-GL in clients before such benefits can be realized. The process holds the potential for extensive benefits to an auditor’s bottom line through both year-end testing savings as well as significant improvements in terms of the timeliness of the audit report. XBRL-GL is a key developing opportunity in the industry, and first movers amongst the assurance industry will reap

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14 XBRL in Tax and Government: Sponsored by the XBRL-GL working group, presentation
15 XBRL in Tax and Government: Sponsored by the XBRL-GL working group, presentation
the most benefit. They will have the strongest templates, and be able to acquire additional clients with the promise of reduced audit costs.
Implications on Financial Statement Fraud Detection

Financial statement fraud has been a facet of financial reporting for decades. The falsification of financial statements “primarily consists of manipulating elements by overstating assets, sales and profit, or understating liabilities, expenses, or losses.”\footnote{Detecting false financial statements using published data: some evidence from Greece, page 1} The extent to which these manipulations occur determine whether fraud has occurred – when the statements no longer fairly represent the true nature of the business, fraud is claimed. Some organizations have estimated that fraud in the United States alone accounts for $400 bn per year in costs\footnote{Data Mining techniques for the detection of fraudulent financial statements, page 1}. For the context of this report, fraud will focus primarily upon managerial fraud – that which occurs due to a concerted effort by management to falsify information.

Currently, fraud detection is beyond the scope of financial auditors. The primary duty of auditors can be understood to be the provision of an opinion as to whether the financial reports represent fairly, in all material aspects, the financial situation of the client. However, the growing incidences and impact of fraudulent acts has incited another shift in the reporting environment. Government regulators are increasingly stringent as to reporting requirements\footnote{Detecting false financial statements using published data: some evidence from Greece, page 2} and there is an increasing demand for assurance against fraud. In addition, while historical detections of management fraud were due to non-computational methods (accidental discovery or whistleblowers), the consistent increases in computational power makes it possible to analyze financial statements with a goal of fraud detection\footnote{Combined Algorithm of Detection of Manipulation in Financial Statements, page 1}.

Thus, fraud detection represents both a risk and an opportunity to the auditing industry as a whole. While several firms have a strong forensic accounting practice, the role of CAs in fraud cases predominantly revolves around the provision of post-fraud services like proving fraud existed or damage valuation. The competitive advantage is clear for a firm that can incorporate fraud detection and assurance into the general audit package without taking on excessive amounts of litigation risk. However, if a third party manages to develop a reliable method of detecting fraud from financial statements, then the role of auditors would be significantly impacted – if a third party could reliably state whether statements are materially misstated simply by analyzing post year-end data, the function of an auditor would be effectively negated.

\footnote{Detecting false financial statements using published data: some evidence from Greece, page 1} \footnote{Data Mining techniques for the detection of fraudulent financial statements, page 1} \footnote{Detecting false financial statements using published data: some evidence from Greece, page 2} \footnote{Combined Algorithm of Detection of Manipulation in Financial Statements, page 1}
Considerable effort has been invested into the development of a method to detect fraud management fraud from analyzing year-end financials. This report will focus upon the use of existing literature that has focused upon utilizing linear models on information publicly disclosed by organizations to determine the statistical probability of fraud. To provide a brief overview of the research method used, most of these studies have developed an algorithm that the researchers believe would predict fraud. The researchers have then applied this algorithm to both fraud-free organizations and organizations that have been accused of managerial fraud. Through this, they have attempted to isolate the identifying variables that would effectively predict fraud.

Findings from Kirkos et al have focused upon the use of automated decision making models to analyze existing financial data and conclude whether fraud exists. The findings of Kirkos et al agree with the anticipated belief that published financial statement data contains indicators of fraud – with a statistically replicable performance of over 90% accuracy in correctly classifying a test sample\textsuperscript{20}. Thus, Kirkos et al effectively provide a compelling proof of concept that it is possible for a user to generate a statement as to whether a statement is fraudulent purely through the analysis of post year-end financial statement data.

Pustylnick complements the findings of Kirkos et al in an attempt to develop a unified algorithm to predict fraud. The stated goal was to reduce fraud detection times – the time lag between perpetuation and detection cause significant economic and social issues for both public and private investors\textsuperscript{21}. Pustylnick’s argument is that since current tools can predict fraud to a certain degree of accuracy, the combination of tools will invariably increase a models ability to identify fraud. His findings indicate that the time of discovery may be reduced simply through statement analysis from an average of six years down to two years\textsuperscript{22}.

While the above methods work well to identify fraudulent statements, they are both heavily reliant on some manner of entering financial statement information into the algorithm. Even though the Kirkos findings indicate that a “relatively small list of financial ratios largely determines the classification results [between fraudulent and non-fraudulent]\textsuperscript{23}” the ability to apply the analytical techniques across many sets of statements remains bottlenecked by the individual nature of financial statements. While

\textsuperscript{20} Data Mining techniques for the detection of fraudulent financial statements, page 8
\textsuperscript{21} Combined Algorithm of Detection of Manipulation in Financial Statements, page 15
\textsuperscript{22} Combined Algorithm of Detection of Manipulation in Financial Statements, page 15
\textsuperscript{23} Data Mining techniques for the detection of fraudulent financial statements, page 8
there exists data mining methods to automatically extract information from financials\textsuperscript{24}, these methods cannot be deemed accurate enough for widespread fraud detection.

XBRL reporting has re-opened the discussion of utilizing automated procedures to detect fraud. Information is now readily available in a machine readable format. Coupling XBRL reports with the increase in computational power now available, it is theoretically possible to run every single financial disclosure of a company through detection algorithms\textsuperscript{25}. Even if financials are not presented in a unified manner, algorithms can automatically tabulate and consolidate based on the XBRL tags. This ability extends from government regulators operating in a monitoring capacity to users themselves operating in a pre-investment screening capacity\textsuperscript{26}.

Auditors must make it a point to understand the shifting technology. Fraud detection strategies are a critical element that must be incorporated into audit plans going forward. Current methods of analysis only offer a limited amount of assurance and require a certain degree of historical data, however, the pace of change in the industry is rapid. As the algorithms improve, other third parties may enter the assurance market and offer fraud assurance purely on the basis of statement analysis. Or, prominent users may shift to internal algorithms instead of relying on audited financials. The requirement for audited financials may diminish substantially.

On the other hand, if auditors work fast in conjunction with researchers and refine their own methods of fraud detection, they can fulfill market demands by themselves. As the only real independent provider of third party assurance, auditors can theoretically crowd out the market. Without a market, it is unlikely that a third party would step in and attempt to develop detection algorithms of their own. It is likely that independent investors would instead use XBRL for analyzing and identifying profit generating opportunities.

In summary, data detection methods have been undergoing development for years. However, XBRL reporting has allowed for the rapid analysis of financial data without the time consuming and error prone data entry process. This has drastically changed the reporting environment and holds as an important risk and opportunity for auditors. Members of the industry must move fast to ensure that they have ample fraud detection strategies in place or risk becoming irrelevant.

\textsuperscript{24} Financial Reporting and Auditing Agent with Net Knowledge and XBRL, Page 13
\textsuperscript{25} Combined Algorithm of Detection of Manipulation in Financial Statements, page 17
\textsuperscript{26} Combined Algorithm of Detection of Manipulation in Financial Statements, page 18
Going forward with XBRL – Expansion of assurance requirements

While XBRL reporting holds the potential to revolutionize the assurance profession, the fact that it is changing the environment so substantially is also a key concern. As with all change, prior methods of conducting business have become irrelevant. For example, if one looks at the advent of the computer, manual audit procedures have lost their importance – meanwhile, audits on IT controls have increased in both level of scrutiny and criticality. The same is true for XBRL reporting. There exists a key concern as to the quality of data that is being produced and reported under XBRL – is it being translated correctly from the financials? Is management tagging items appropriately? Current standards do not guarantee any level of accuracy; the SEC has only required companies to file in an XBRL format.

As the demand for XBRL financials increases and industries begin to perform more complicated analyses reliant upon XBRL filings, accuracy in XBRL reporting becomes increasingly critical. Use of automated decision making models for investment purposes would be exceedingly dangerous if there was no assurance as to the accuracy of XBRL data. The impact on the financial markets would be even more drastic than fraudulent statements today. Whereas current statements are not instantly taken into account into the financial markets, investors could develop systems that automatically invest and sell based on XBRL filings. In essence, XBRL escalates the pace of business considerably, and thus, the impact of an error or fraud would be equally magnified.

At initial glance, it would appear that the obligation to provide assurance on XBRL tagging would fall onto audit professionals. As the current primary assurance providers, audit professionals are closely involved in the creation of financial statements. However, it is also arguable that the duty of auditors lies solely in ensuring that the statements are free of material misstatements.

Regardless of where the obligation officially lies, it suffices to say that until there is some method to determine the accuracy of the tagging process, the potential gain of XBRL reporting will be extensively hampered. Thus despite the uncertainty in auditor obligations, it may be prudent for auditors to involve themselves in the XBRL tagging process. Their influence may positively impact the adoption of XBRL-GL, which can be understood as a bridging gap between transactions and reporting. It is logical to assume that a reduction in the translation requirements will naturally lead to an improvement in reporting quality. Overall, this should lead to a long term future benefit.

27 Assurance on XBRL for Financial Reporting, page 4
28 Does it add up? Early Evidence on the data quality of XBRL filings to the SEC, page 10
Conclusion

This report has explored the potential changes to the reporting environment that may occur if XBRL reporting acquires mainstream approval. The assurance industry specifically will have to find some manner to cope with the shifting environment. Both the preparer side and the user side are liable to experience extensive changes.

On the side of the preparer, XBRL reporting may revitalize the concept of continuous auditing. This concept, while proven as viable, has had significant troubles getting off the ground. XBRL-GL eases the difficulties associated with continuous auditing, improving the likelihood of implementation. This could result in audits becoming increasingly efficient. Both the timeliness and costs of audits are expected to decrease.

On the side of the user, XBRL reporting exponentially improves upon user’s ability to mine data from the financials. This is important in terms of assurance as it allows the widespread implementation of fraud screening checks without the arduous data entry process. As it stands, this threatens to make the role of the auditor obsolete.

Adoption of XBRL taxonomies may also expand the role of the auditor. There exists a gap in the level of assurance provided on XBRL data quality, and the demand of industry. Expansion into this role may allow auditors greater influence into the changing technology. In doing so, they may experience cost and timing benefits.

In conclusion, XBRL reporting holds the potential to irreversibly alter the reporting environment. It is the responsibility of auditors as a part of their role as assurance providers to keep abreast of the changing environment. Else the profession may suffer extensive damage – both in terms of market share and reputation.
### Annotated Bibliography

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#### Annotation
The concept of a continuous audit revolves around the real time auditing of financial statements to support the principle of relevance to the user. Demand increases and technological availability have driven the popularity of the continuous audit. This has in turn driven the need for additional frameworks and techniques while seeking out additional enabling technologies for continuous auditing. In time, such methods of continuous audit may supplant traditional audit plans, and allow for a continuous disclosure of financial statements.

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#### Annotation
Prior to XBRL implementation, there were many challenges involved in large sale data analysis. Individuals had to manually conduct analysis across statements. FRAANK is a method to parse out data from text financial statements for use in wide scale data analysis. There is also the potential for using FRAANK to tag components for XBRL reporting purposes. However, while FRAANK allows for an extension in the analytical capabilities of statement users, it remains that it is not fully reliable in its data parsing techniques. However, if there was a more effective method to pull out specific predetermined individual financial statement elements, then the level of analysis possible is vastly extended.
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**Annotation**

The SEC has mandated that XBRL reporting be a mandatory part of the disclosure environment. However, the process of XBRL tagging has the potential for many errors in terms of data accuracy. While a large portion of filers managed to utilize the taxonomy guides correctly, a significant percentage experienced difficulties in terms of positive/negative valuation. Such simple errors have material impacts upon the resultant tagged financials.

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**Annotation**

Embedded audit modules are pieces of software that automatically identify flaws and evaluate transactions per a set of constraints. While it has the potential to be immensely powerful in substantive testing, there is limited adoption. However, there is the potential to increase widespread adoption through the embedding of EAM in ERP software – something that organizations almost universally utilize.
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**Annotation**
The challenges of auditing have grown exponentially with the increasing prevalence of fraud. This has created a demand for the development of a classification process to alert auditors and users of the likelihood of fraud. Through use of neural networks and Bayesian formulae, Kirkos et al have combined prior research on financial statement variables to develop a method to classify statements. This method focuses upon the financial ratios present/calculable from financial statement disclosures. It appears that a small number of financial ratios play a sizeable role in determining whether financial statements as a whole are fraudulently misstated. Thus, there seems to be a method to effectively classify financial statements during the audit process itself, as likely to be fraudulent or non-fraudulent.

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**Annotation**

XBRL has far ranging implications upon the business reporting environment, with notable audit and fraud detection benefits. XBRL: essentially is the “digital language of business”, built with HTML as a base, and adapted to allow for a standardized information tagging system for businesses. Within professionals, there is a lack of general knowledge about XBRL, but a reasonable belief that it will hold some benefits in terms of internal and external audit.

The XBRL rollout has allowed for users to extract data from EDGAR across a wide variety of corporate reporters. This has created a paradigm shift from analyzing small sets of financial statements to a much wider spread of organizations. However, this has resulted in a much higher need of assurance – and the requisite subjective decision making regarding materiality and sampling – in regards to the accuracy of the XBRL tags being used.

Fraud prevention is ineffectual, and thus, it is more important to focus upon fraud detection. Current methods that analyze financial statement data required an average period of six years before flagging statements as fraudulent. These methods can be combined and used in conjunction if there is data readily available. Upon unifying these methods, Pustylnick has developed a combined algorithm that can begin accurately identifying fraudulent statements as early as two or three years after occurrence.
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**Annotation**
Fraud is clearly prevalent and the obligations of auditors to detect managerial fraud are increasing. The information contained in year end reports can be an important area of analysis in the fraud detection process. The research posits that analysis of key financial ratios could serve to project the existence of fraud. In addition, the study provides an excellent starting understanding of the concepts of fraud detection through financial statement analysis. The findings of Spathis indicate that ratios are indeed a key indicator as to the existence of management perpetuated fraud.