



A Preliminary Study toward Development of a Tool to Help Detect Accounting Improprieties in Japan

Yasuo Uchida^{1*}, Shinya Tagawa¹, Seigo Matsuno¹, Makoto Sakamoto²

¹National Institute of Technology, Ube College, Ube, Japan, ²University of Miyazaki, Miyazaki, Japan. *Email: uchida@ube-k.ac.jp

Received: 15 November 2018

Accepted: 23 December 2018

DOI: <https://doi.org/10.32479/irmm.7249>

ABSTRACT

Japan in recent years has seen a succession of cases of accounting improprieties. For example, a study by Tokyo Shoko Research shows that 57 publicly traded companies disclosed improper accounting or bookkeeping during 2016 (January–December), reflecting a rapid increase of 2.2 times from the 25 companies that did so in 2008. The increase in such cases among major firms whose shares are traded on the First Section of the Tokyo Stock Exchange stands out in particular. Factors that have been identified as possibly being behind this rapid increase include compliance failures, lack of knowledge, demanding excessively tough quotas from employees, and enhancement of auditing systems. The cases of accounting improprieties at Olympus and Toshiba in particular involve aspects that could be described as issues involving society as a whole. In addition, the fact that auditors proved unable to detect these cases of accounting improprieties and other issues at the companies they audited has shaken trust in auditing itself. Accordingly, as a preliminary study toward the development of a tool to help detect accounting improprieties in Japan, the author will attempt to detect the possibility of accounting improprieties from the content of the publicly released securities reports of the companies involved in these cases. Specifically, the author developed a simple automated tool to extract and graph cash-flow information from the securities reports available for downloading from EDINET and then considered whether these graphs could be used to identify signs of accounting improprieties.

Keywords: Accounting Fraud, EDINET, Detection Support

JEL Classifications: M1, M4

1. INTRODUCTION

1.1. Definition of Accounting Improprieties

The Japanese Institute of Certified Public Accountants defines “fraud” as follows: Fraud refers to intentional misrepresentation in financial statements or to intentional acts by managers, directors, auditors, employees, or third parties, including acts to deceive others in order to secure improper or unlawful gains (The Japanese Institute of Certified Public Accountants, 1997). It defines “error” as an unintentional mistake that causes a misstatement on financial statements.

Although it does use the term “improper accounting” in some cases, it has been pointed out that this term is used at a level that does not make clear whether or not such acts were intentional (MS-Japan, 2016).

1.2. Trends in Companies Disclosing Improper Accounting

A study by Tokyo Shoko Research shows that 57 publicly traded companies disclosed improper accounting or bookkeeping during 2016 (January–December), reflecting a rapid increase of 2.2 times from the 25 companies that did so in 2008 (Tokyo Shoko Research, 2016) (Figure 1). This study totaled numbers of publicly traded companies issuing securities reports that had disclosed that improper accounting or bookkeeping had impacted their settlement of accounts in previous fiscal years or could have an impact in the future, based on public materials such as those disclosed by the companies themselves and those released by the Financial Services Agency, the Tokyo Stock Exchange, or other authorities. The increase in such cases among major firms whose shares are traded on the First Section of the Tokyo Stock Exchange stands out

Figure 1: Trends in companies disclosing improper accounting

Source: Similar graph prepared based on Tokyo Shoko Research [3]

in particular. Factors that have been identified as possibly being behind this rapid increase include compliance failures, lack of knowledge, demanding excessively tough quotas from employees, and enhancement of auditing systems.

1.3. EDINET

EDINET is a system used in Japan for electronic release of disclosure documents such as securities reports pursuant to the Financial Instruments and Exchange Act (Financial Services Agency). Its name stands for “Electronic Disclosure for Investors’ Network.” A securities report is a disclosure document concerning the internal details of a company, prepared annually by publicly traded firms pursuant to the Financial Instruments and Exchange Act. Companies that submit securities reports are considered to include publicly traded firms.

EDINET released disclosure documents in XBRL format. XBRL (XBRL International), which stands for “eXtensible Business Reporting Language,” is an XML-based computer language that standardizes the information in various business reports (i.e., financial, management, investment, and other information) for preparation, distribution, and use.

The EDINET website may be used, for example, to download securities reports for an entire industry, in bulk, in XBRL format. Accordingly, the author attempted to detect the possibility of accounting improprieties using information from securities reports.

2. RELATED WORKS

2.1. Trends in Accounting Improprieties and Analysis Thereof

Previous studies have looked at trends in accounting improprieties and analysis thereof mainly through qualitative analysis of case studies of accounting improprieties from 2004 through 2013 (Ichinomiya, 2016) and (Ichinomiya, 2017). They have pointed out that, despite developments such as the adoption of internal controls and amendment of auditing standards, accounting improprieties have been discovered not only among new ventures and SMEs but among long-established firms and major firms as well, and that the risk of improprieties is increasing overall. Furthermore, they also argue that they have confirmed important trends in improprieties related to sales transactions, improprieties at domestic and foreign

subsidiaries, improprieties by new companies, improprieties in other than core businesses, and improprieties in large, well-known firms.

Another study analyzed why window-dressing continues to be an issue in settlement of accounts (Fujimori, 2015). During the 1-year period of 2015 alone, the number of companies that disclosed such cases in a timely manner to the Tokyo Stock Exchange was 11 firms, including Toshiba. His analysis shows that the most common method of accounting improprieties is that of concealing losses through recording of inflated sales, profits, or assets.

2.2. Overview of the Case of Accounting Improprieties at Olympus

The case of accounting improprieties at Olympus involved window-dressing of liabilities in settlement of accounts, after continuing to conceal actual profit and loss figures for a long period of more than 10 years through transfer of depreciated securities.

One study examined the case of Olympus to consider how accounting standards were applied (Yamada, 2013). Through analysis based mainly on the perspective of application of accounting standards, it argues that the facts that since Olympus’ president had strong authority and the financial section was controlled by a small number of staff, monitoring by other directors and employees failed to function appropriately, and that since the auditing firm had been changed, application of accounting standards had not been discussed sufficiently, had major impacts on this case.

2.3. Overview of the Case of Accounting Improprieties at Toshiba

The case of accounting improprieties at Toshiba involved padding of profits by 224.8 billion yen in total over a period of 7 years up to fiscal 2014.

One study mainly elucidates the cause of the detection of this case of accounting improprieties at Toshiba, by analyzing the background of the case (Matsumura, 2017). It argues that the main causes may have been the gap between Toshiba’s position within the industry and its business performance, the restrictive financial covenants that it had concluded with financial institutions, miscalculations in the acquisition of Westinghouse, and the gap between “novel” management methods and the nature of the company.

Another study considered issues related to internal controls and accounting improprieties at Toshiba through analysis of their background and various contributing factors, and then offered proposals for improvement (Sakai, 2016). It pointed out the issue of internal dissension among members of top management, and then proposed measures such as efforts to prevent reckless acts by management, tense relationships based on balance with outside directors, and fostering of an open corporate culture that facilitates communication.

2.4. The Financial Services Agency’s Responses to Cases of Accounting Improprieties

One of the Financial Services Agency’s responses to successive cases of accounting improprieties was a combination of efforts

to increase the reliability of accounting audits (Song, 2018). One of these is a review of previous studies on early detection of improper accounting, while another consists of recommendations for developing models for early detection of improper accounting based on the results of analysis of previous studies. With regard to the latter response of model building, it reviews studies that reflect machine-learning algorithms, which have been attracting attention in recent years, in development of models to predict accounting improprieties.

2.5. Auditors' Responses to Cases of Accounting Improprieties

Although the Japanese Institute of Certified Public Accountants issued a detailed report on policies for responding to improprieties in auditing of financial statements in 2006 (The Japanese Institute of Certified Public Accountants, 2006), in response to severe social criticism of the failure to identify so many major accounting improprieties, it is reconsidering cases of accounting improprieties and responses in practical auditing (Kitayama, 2012). It is pointing out the need for in-depth auditing with sufficient attention paid by professional experts, based on a full understanding of matters such as companies' business models and common industry practices, properly assessing the risks of material misstatements, formulation of auditing plans, thoroughly implementing demonstrative procedures, and summarizing, forming opinions on, and reviewing the results of auditing.

2.6. An Approach to Detecting Accounting Improprieties

Since limitations have been identified in traditional auditing methods, there is a need for a new approach to detecting accounting improprieties.

For example, studies have looked at using the artificial-intelligence technology of machine learning to predict accounting improprieties (Ichihara, 2017) and development of forecasting models using univariate analysis and logit regression analysis (Shuto et al., 2016).

3. RESEARCH METHODOLOGY

As the basis for building a simple tool to help mainly ordinary investors detect accounting improprieties, the author focused on detecting the possibility of improprieties using the statement of cash flows (Okamura, 2016). This study proposes a unique method that employs automation of data collection, selection and specification of the years subject to analysis, and automation of graphing.

3.1. Accessing Securities Reports from EDINET: Ufocatch.com

The search function on the EDINET website can be used to download securities reports available on the site. However, flexible operations such as downloading securities reports for specific periods or companies requires use of methods such as web scraping. Doing so is a complex and troublesome process. Still, this is one appropriate method of collecting data. In an attempt to avoid complex procedures as much as possible, this study employed the Ufocatch.com (Precis) service that transmits

data using an Atom-format (Internet Engineering Task Force) API to access financial data from securities reports. Atom is an XML-based format for transmitting Web content and metadata, standardized under the RFC 4287 format.

3.2. Extracting Data from Securities Reports

The author used the TeCAX (Precis) tool to collect data from securities reports using the Ufocatcher service. TeCAX is a simplified viewer for XBRL data disclosed through EDINET, operated by the Financial Services Agency, and as timely settlement-of-accounts information and corporate governance information released by the Tokyo Stock Exchange. TeCAX can be used to download data in XBRL or CSV format, but in this case the data were downloaded in CSV format to simplify subsequent processing. In addition, the Python language (Python Software Foundation) was used as a software environment for accessing and processing data, but efforts were made to summarize the process in procedures that can be used easily even by non-experts.

- TeCAX was used to download securities reports for specific companies and periods, in CSV format.
- A program prepared using Python was used to extract specific information from the files downloaded.

3.3. Loading the Data to Excel Files and Graphing Them

An embedded Excel file (in.xlms format to enable execution of macros) was prepared that included a VBA program to graph the data.

A Python program was used to load the data extracted as described in the preceding paragraph to the appropriate cell in the Excel file and graph the data by executing the macro automatically.

4. RESULTS AND DISCUSSION

4.1. The Case of Olympus

The Olympus data for the fiscal years ended March 2004 through March 2017 are shown in Table 1. However, since data are available from EDINET only for the fiscal years ended March 2009 and later, previous data were obtained, for reference, directly from the official Olympus website.

Figure 2 is a semi-automated graph based on the data in Table 1.

Figure 2: Olympus cash-flow trends

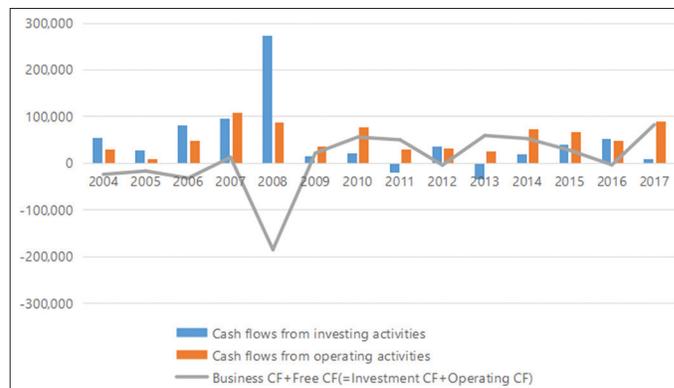
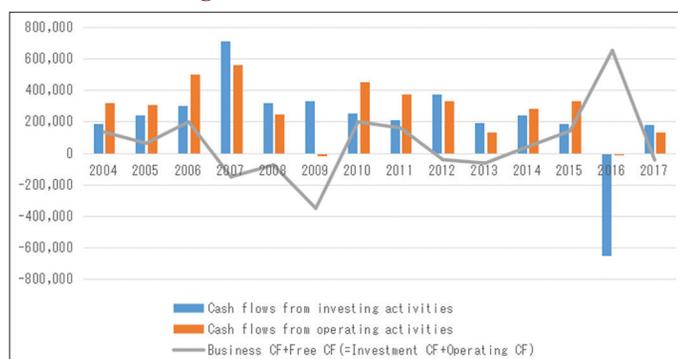


Table 1: Olympus cash-flow data

Year	The fiscal period end	Cash flows from investing activities	Cash flows from operating activities	Notes
2004	3	(55,211)	30,537	
2005	3	(27,542)	10,025	
2006	3	(81,755)	49,034	
2007	3	(96,481)	108,400	
2008	3	(274,104)	88,204	
2009	3	(15,964)	36,864	EDINET Information over the past 5 years
2010	3	(20,967)	76,245	
2011	3	19,003	30,469	Fraud
2012	3	(35,735)	30,889	
2013	3	33,455	25,233	
2014	3	(20,273)	72,388	
2015	3	(39,612)	66,811	
2016	3	(52,897)	48,621	
2017	3	(8,305)	90,194	

Table 2: Toshiba cash-flow data

Years	The fiscal period end	Cash flows from investing activities	Cash flows from operating activities	Notes
2004	3	189,466	322,662	
2005	3	243,106	305,533	
2006	3	303,385	501,426	
2007	3	712,781	561,474	
2008	3	322,702	247,128	
2009	3	335,308	(16,011)	EDINET information over the past 5 years
2010	3	252,922	451,445	
2011	3	214,700	374,084	
2012	3	377,227	334,997	
2013	3	196,347	132,316	
2014	3	244,101	284,132	
2015	3	190,130	330,442	Fraud
2016	3	(653,442)	(1,230)	
2017	3	178,829	134,163	

Figure 3: Toshiba cash-flow trends

2009 and later, previous data were obtained, for reference, directly from the official Toshiba website.

Figure 3 is a semi-automated graph based on the data in Table 2.

A look at Figure 3 shows that the balance between cash flow from/used in investment activities and cash flow from/used in operating activities broke down considerably beginning around 2007, although the impropriety was discovered in 2015, and these notable accounting circumstances can be considered to have continued after then.

5. CONCLUSION

A tool was used to graph, in a semi-automated manner, data accessed from EDINET for the two companies examined, and the convenience of this tool was confirmed. While these cases involved the possibility that the impropriety took place prior to the date range of the data accessible from EDINET, and for this reason some data were processed manually, semi-automated graphing was possible for data from fiscal years ended March 2009 and later. Accordingly, this study can be said to have demonstrated the feasibility of developing a tool to support detection of accounting improprieties through simple operation.

A look at Figure 2 shows that the balance between cash flow from/used in investment activities and cash flow from/used in operating activities broke down considerably in 2008, 3 years prior to discovery of the impropriety in 2011, and this can be considered a sign of irregular cash-flow figures.

4.2. The Case of Toshiba

The Toshiba data for the fiscal years ended March 2004 through March 2017 are shown in Table 2. However, since data are available from EDINET only for the fiscal years ended March

Topics to be addressed in the future include consideration of the realization of a flexible interface for purposes such as changing the elements displayed automatically and of combinations of graph expressions to enable more in-depth investigation.

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