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ISLAMIC INTERNAL CONTROL IN NON-ISLAMIC ENVIRONMENT: A NECESSITY FOR JAPANESE COMPANIES

Mehriban Ahmadova, Nagoya University

ABSTRACT

In 2001 a Japanese foreign subsidiary failed to follow Islamic rule despite labeling the opposite, which damaged the reputation of the subsidiary company and negatively affected the share prices of the parent company. Since Islamic finance started its rapid growth as a global alternative financing, Japanese companies have also demonstrated a strong interest in investment into Islamic finance. The purpose of this study is to describe arguments, which will explain the necessity of conducting Islamic internal control in overseas subsidiaries involved in Islamic finance by Japanese parent companies. As a result of literature review and historical and international comparison followings were found: (1) internal control is an important tool for managing risks of the company. Furthermore, risks are higher because chances for misconduct increase when subsidiaries are maintained abroad; (2) Islamic internal control is going through a formation phase, when it is facing several challenges. These challenges are significant obstacles for building strong and well-developed Islamic internal control. And the companies involved in Islamic finance should be more caution because any Sharia non-compliance may seriously affect the whole business; (3) overall uniqueness of Islamic finance in a non-Islamic environment creates additional risks for business. Based on these findings I conclude that Islamic internal control is a necessary measure for prevention of misconduct in Japanese subsidiaries involved in Islamic finance.

INTRODUCTION

Islamic finance is a term used to describe financial services mainly implemented in accordance with Islamic law or Sharia. Sharia consists of many rules and principles that will be briefly discussed in the next chapter. Not without purpose in the West Islamic finance usually is referred to as an "alternative" financial industry, which means that, unless Islamic Financial Institutions (IFIs) strictly follow Sharia rules and guidelines, there is no reason for existence of Islamic financial industry. The core of Islamic finance is Sharia. To ensure complete Sharia compliance, IFIs conduct Islamic internal control or Sharia audit, which can be done by both internal and external auditors and supervised by a Sharia Supervisory Board (SSB).

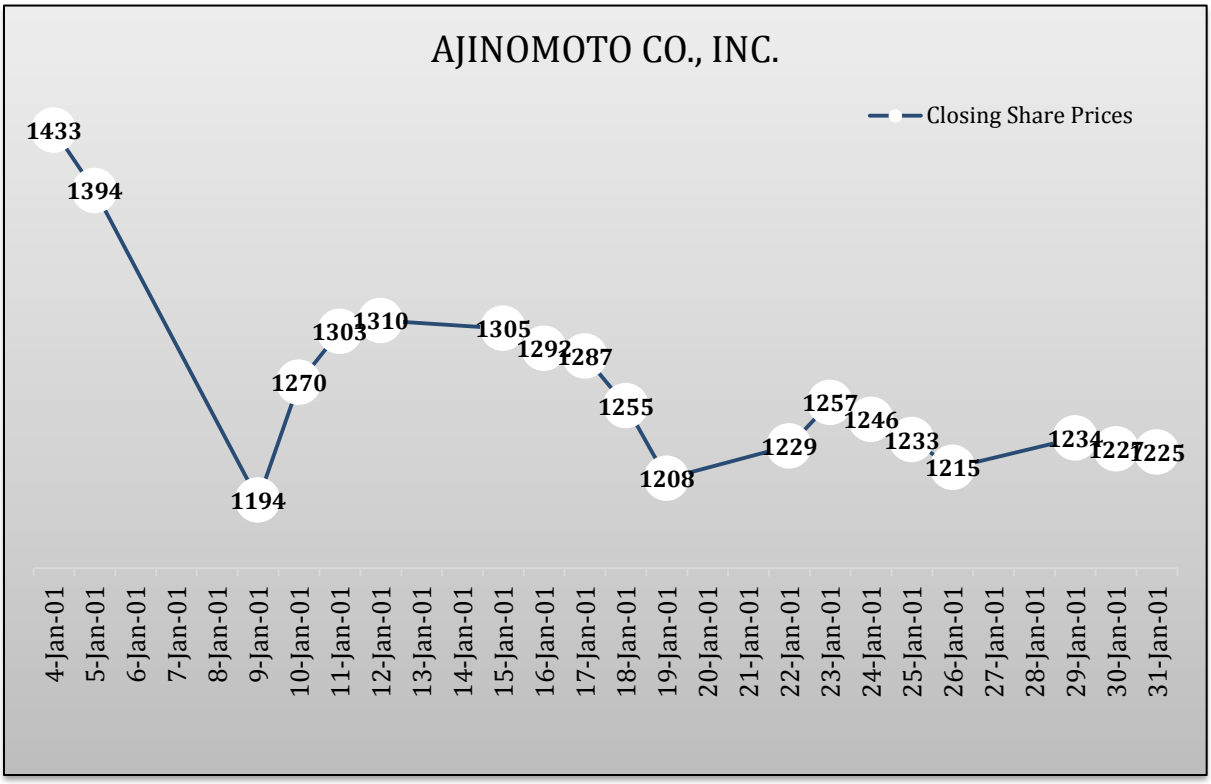
Halal certification in Indonesia is the process conducted by Majelis Ulama Indonesia (MUI; Indonesian Council of Ulama). By issuing this certificate MUI grants its approval of the product's complete permissibility from the religious point of view. Considering that Indonesia has the world's largest Muslim population (BBC, 2014), which amounts to 204,847,000 people as of 2010 (Rogers, 2011) that is approximately 88% of the overall population of Indonesia, halal certification plays an important role. Producers can apply to receive halal certificate voluntarily. Japanese-owned PT Ajinomoto Indonesia received its first halal certificate in 1998. However, since the certificate is valid only for two years, in 2000 the company had to reapply. As a result of an investigation conducted by MUI it had been clarified that one of the ingredients had been

changed without MUI's awareness. After detailed study of this new ingredient, Bactosoytone, MUI found that a pig pancreas was used in its manufacturing (Kobayashi, 2002).

Consequently, in January 2001 Ajinomoto Indonesia seasoning product was banned from sale by Indonesian Department of Health. Ajinomoto-Indonesia had acknowledged that enzyme extracted from pork has been used in the manufacturing of its seasoning product, but denied that the end product contained material prohibited by Islam. A chemistry professor at Gadjah Mada University, Umar Anggoro Jenie, criticized MUI's fatwa (Islamic legal opinion): "Bactosoytone is not an active material. So Ajinomoto is not a *haram* item" (haram – forbidden or proscribed by Islamic law). According to some scholars, this situation could have been included in the category of *khilafiyah*, an issue on which different opinions are legitimately possible (Kobayashi, 2002).

The case of Ajinomoto was not an Islamic finance related one. The company only labeled its product Islamic permissible. Nevertheless the consequences of this mistake had a high price. Ajinomoto Indonesia had announced plans to buy back about 3,000 tons of its seasoning products worth Rp30 billion (US$3.35 million). Moreover, on January 9, 2001 share prices of the Ajinomoto Co. declined by their daily limit of 200 yen at the Tokyo Stock Exchange (Ando, 2001) (Graph 1).

Graph 1



Source:http://finance.yahoo.co.jp/

Strong internal control process should have foreseen the possibility of this situation. However insufficient knowledge about Islamic rules and principles caused such inadvertence. The parent company has been affected equally as the subsidiary.

The question that comes to mind is how different would have been an effect of this situation if the company was actually involved in Islamic finance? The existence of Islamic

finance is based on its differences from conventional finance. If companies will fail to follow principles of Islamic finance, they may as well lose investors' confidence. Therefore, Islamic internal control conducted by Japanese parent company is a necessary measure for prevention of misconduct in subsidiaries involved in Islamic finance.

The purpose of this paper is to describe a necessity of conducting additional Islamic internal control in Japanese subsidiaries by their parent companies based on a literature review and historical and international comparison.

The results of this paper will clarify potential challenges of Japanese parent companies controlling their subsidiaries involved in Islamic finance, thereby reducing risks of misconduct or Sharia non-compliance. Although this work is the first step in researching Islamic internal control of Japanese companies, it will be a useful reference for corporate governance sector of interested companies. Unfortunately, there is a significant lack of literature about Islamic internal control. Moreover, academic research papers covering this topic related directly to the Japanese market are even less abundant. Therefore, this work will also contribute to the literature of Islamic internal control in the Japanese market. Prior research works have described the importance of Islamic internal control in companies involved in Islamic finance; however, this paper aims to describe the importance of conducting Islamic internal control by parent companies in their subsidiaries.

RESEARCH BACKGROUND

Development of Islamic Finance

During the events of 2008 when the global financial markets were struggling against the crisis, the world started asking questions about the fundamental structure of the conventional financial system (Rarick & Han, 2010). Investors and others in search for the answers realized the existence of an alternative system, - Islamic finance, which is built around certain principles and rules. One of the major ones is the prohibition of receiving or paying interest.

The beginning of Islamic finance goes back to the 6th century when Islam as a religion took its start. The first Islamic financial instruments were most efficient during the era known as "Islamic civilization" (VI - XI centuries). During this period the main guiding law of Islam – Sharia was introduced (Schoon, 2008). Sharia is derived from the Qur'an (word of God) and Sunnah (the sayings of Prophet Muhammad (s.a.s.)). Even though originally Islamic finance has a long history, the world became acquainted with it only in the 20th century. Although rapid development of Islamic finance in recent history began in the middle of the 1980s, the first Islamic financial company of the 20th century was established in 1963 with the Mit Ghamr Local Savings Bank in Egypt (Schoon, 2008). The project was abandoned for political reasons, however it is still considered to be the first Islamic financial institution, which gave a start to a modern Islamic banking/finance (Botish, 2013).

Islamic finance is a fast-growing source of finance for Muslim and non-Muslim investors around the world. In recent years, Islamic Finance has grown rapidly across the world conservatively estimated at 15-20% (Hancock, 2013; Ernst & Young, 2013; MIFC, 2013). The followings are the key findings of the World Islamic Banking Competitiveness Report 2013-14 by Ernst & Young: (1) compared to the conventional average of 15%, the average return on equity for the top 20 Islamic banks is 12.6%; (2) Islamic banking assets with commercial banks globally are estimated to reach US$1.7t in 2013; (3) 38 million customers globally. The global Islamic financial services market has demonstrated rapid growth between 2010 and 2012 by

approximately 33%. Currently it represents about 1% of the worldwide financial services industry (Clifford Chance, 2013).

There are several reasons for the rapid expansion of the Islamic financial system. First of all, Islamic and conventional finance can coexist, and financially developed countries like the UK would like to create an alternative financial system in order to expand customer and investor variety. Secondly, Gulf countries, the population of which mainly consists of Muslims, are rich with oil and gas. The more Sharia compliant product emerges the more Gulf wealth will flow into Islamic financial products. Thirdly, the Muslim population of the world, which is growing nearly twice as fast as the non-Muslim population, wants and needs Sharia compliant products. Moreover, non-Muslim investors are interested in it as much as Muslim investors are. Fourth, socially responsible investing is thriving, and socially responsible investors look for something that Islamic finance already offers. Finally, globalization is inevitable. At present, companies seek for customers all over the globe, and many of those customers are Muslims.

The basic framework of providing Islamic financial services is based on the following principles (HM Treasury, 2008, 7):

- "Prohibition of the payment or receipt of interest (riba): money itself is considered to have no intrinsic value – it is merely a store of wealth and medium of exchange;
- Prohibition of uncertainty (gharar) or speculation (masir): everybody participating in a financial transaction must be adequately informed and not cheated or misled;
- Prohibition of financing certain economic sectors: investment is forbidden in what are considered to be socially detrimental activities. These include gambling, pornography, alcohol and armaments;
- Importance of profit and loss sharing: the investor and investee must share the risk of all financial transactions; and
- Asset-backing principle: financial transactions should be underpinned by an identifiable and tangible underlying asset."

As Islamic finance continues to grow, many governments have taken, or are taking, steps to accommodate the asset based nature of Islamic finance to ensure equal treatment, particularly from a tax perspective, between Islamic and conventional forms of finance. For example, the UK aimed to attract Islamic finance to London, to one of the biggest financial centers of the world and to name London "an unrivalled western center for Islamic finance" (Osborne, 2013). One of the main tasks standing in front of the UK government was to maintain balance between Islamic and conventional finance by regulating the legislation. As a result of those legislative changes tax barriers for Islamic finance were reduced and Islamic financing arrangements (in UK legislative acts – "alternative financing arrangements") were considered as "loan relationships" (Clifford Chance, 2013). Currently, the UK has become the leading center of Islamic finance in the west.

In spite of the UK being in the list of top countries implementing Islamic finance, an environment (Islamic or non-Islamic) under which Islamic finance is implemented has a great importance. In other words, the implementation of Islamic finance industry will certainly have more obstacles, for example, in the UK than compared to Saudi Arabia or Malaysia.

Hasan (2009) named three main jurisdiction models of the Sharia governance system: mixed legal jurisdiction, Islamic and mixed legal environment, and non-Islamic legal environment. Countries representing these models in his study, respectively, are Malaysia, GCC, and the UK.

Development of Islamic finance in Japan

In 2013 Hirofumi Tanada from the Faculty of Human Sciences at Waseda University conducted a research estimating Muslim population of the world and Japan based on various materials including "Register of Foreign Residents in Japan" as of 2011 (Table 1). It was found that the total population of Muslims in Japan as of 2011 was 105,565.

Compared to the Muslim population of UK, which was 2,786,635 only in 2011, a population of 105,565 Muslims in Japan is not a significant number. And here could be asked a question: why does Japan need Islamic finance if there is almost no demand from the population? The speech given by the Governor of the Bank of Japan Toshihiko Fukui at the Nikkei Islamic Symposium 2008: "Islamic Finance: Constant Evolution and Emerging Opportunities" could be used to answer this question: "… The development of Islamic finance brings diversity to financial markets and financial transactions. ...To date, Islamic finance institutions have provided many products that replicate those of conventional finance while respecting Islamic values, where interest, or riba, is prohibited. In other words, Islamic financial institutions have successfully provided conventional intermediary functions by utilizing the latest financial technology…"

Table 1
MUSLIM POPULATION OF JAPAN AS OF 2011

TYPE OF POPULATION	POPULATION
Foreign Muslim Residents	91,744
Japanese Muslims	11,189
Other Muslims	2,632
TOTAL	105,565

Islamic finance found its way into the Japanese market only in the beginning of the 21st century (Table 2). However it is not commonly known that, according to Al-Omar & Abdel-Haq (1996), the Industrial Bank of Japan was involved in trading based on Islamic finance in London already in the 1980s.

Despite recent developments in Islamic finance in Japan (Table 2), compared to the UK the current situation of the Japanese legal system is less Islamic finance attractive. Japanese banks are only permitted to conduct the activities that are listed in the banking law and the ancillary activities to such listed activities. For example, the banking law of Japan does not permit banks to buy products. Under this condition banks cannot participate in Murabaha and Ijara transactions. Furthermore, in Japan banks are allowed to invest in securities (e.g. Mudaraba and Musharaka), only if they are considered to be pure investors (Saito & Yoshimine, 2008).

The proposal to permit bank's subsidiaries to deal with Islamic financial products came from Japanese Financial Services Agency in 2007, and already in 2008 the amendment was enacted (the Amendment to the Ordinance on the Enforcement of Banking Act).

The enactment of Article 17-3.2 (ii)-2 allowed subsidiaries of Japanese banks to conduct "lending" type Islamic finance transactions. The amendment stipulated that subsidiaries can handle such business if the transaction satisfies the following three conditions: (1) the transaction is "deemed equal to money lending", although not money lending itself; (2) no interest should be charged because it is prohibited by religious discipline; (3) the board, members of which have professional knowledge of the religious discipline of

such non-lending transactions, support these transactions (Saito & Yoshimine, 2008; Saito & Igarashi, 2010).

Table 2
CHRONOLOGICAL DEVELOPMENT OF ISLAMIC FINANCE RELATED ACTIVITIES IN JAPAN

YEAR	COMPANY	CONTENT	SOURCES
2001	Tokio Marine	Launched takaful business in Saudi Arabia	Tokio Marine
2004	Tokio Marine	Set up Retakaful company in Singapore	Angelo (2006)
2004	Tokio Marine	Started takaful business in Indonesia	Lai (2010)
2005	JBIC	Co-finance with Islamic finance to Bahrain	Etsuaki (2007)
2005	ARCAPITA	Set up Islamic Fund for Japanese properties	REDmoney (2014)
2005	Tokyo Commodity Exchange	Signed MOU with BMA for Islamic trades	REDmoney (2014)
2006	JBIC	Established Sharia Advisory Group	Etsuaki (2007)
2006	JBIC	Established study groups with Japanese banks	Etsuaki (2007)
2006	Tokio Marine	Established takaful company in Malaysia	REDmoney (2014)
2007	JBIC	Co-hosted a seminar in Tokyo with IFSB	Etsuaki (2007)
2007	JBIC	Joined IFSB as a first Japanese institution	Etsuaki (2007)
2007	JBIC	Signed MOU with Bank Negara Malaysia	Etsuaki (2007)
2007	Aeon Credit	Issued sukuk in Malaysia	REDmoney (2014)
2008	Tokio Marine	Takaful license was given in Egypt	REDmoney (2014)
2008	Toyota	Issued sukuk in Malaysia	REDmoney (2014)
2008	Nikkei	Held Islamic finance seminar	REDmoney (2014)
2008	Financial Services Agency	Changed the banking regulation	REDmoney (2014)
2009	SMBC/BTMU	Set up Islamic Banking teams in Malaysia	REDmoney (2014)
2010	Nomura	Announced issue of $100m. sukuk in Malaysia	REDmoney (2014)
2010	Tokio Marine	Launched takaful operations in Egypt	Lai (2010)
2014	Tokyo Mitsubishi UFJ	Set sukuk program in Malaysia	Hamzah (2014)

"The enactment of this article was a monumental step because it was the first law which was intended to directly target and hope to further promote the development of Islamic finance in Japan." (Saito & Yoshimine, 2008, 2).

In addition to this amendment also several tax reforms took place. As a result of these reforms, (1) a foreign partner may invest in an Investment LPS without being regarded as owning a Japanese PE, subject to certain conditions including that the foreign partner owes limited liability and is not involved in the management of the Investment LPS, and that the foreign partner's investment ratio in the Investment LPS is less than 25%; (2) application of the 25/5% rule has been relaxed, and the 25% threshold may be applied at the individual foreign partner's level, instead of the whole foreign fund level, subject to certain conditions. (Saito & Igarashi, 2009).

Under the scope of the amendments of the Japanese Asset Securitization Law in 2011 the nature of sukuk has been reviewed. After this reform tax exemption was given to foreign investors who purchase "Bond-Type Beneficial Interests" which are quasi-bond beneficial interests of a "Specified Purpose Trust" (SPT) established under the Asset Securitization Law, which will be the basis for the issuance of sukuk in Japan. (Clifford Chance, 2011).

By enacting these amendments and reforms the Japanese government was aiming to remove the obstacles for development of Islamic finance in Japan.

LITERATURE REVIEW

Internal Control of Parent Companies and their Subsidiaries

The importance of internal control has been highlighted during the late 1990s and early 2000s. "Major reasons for corporate governance being in the spotlight are unexpected bankruptcies, fraud and mismanagements" (Hayes et al., 2005, 598). The most noticeable examples are Enron, WorldCom, Maxwell, Daiwa, etc. After the financial world witnessed failures in 2001 and 2002, the US Congress passed a new law (commonly known as the Sarbanes-Oxley Act or SOX) in 2002. This act, which is considered to be the most significant corporate regulation since the Securities Act of 1933 and the Securities Exchange Act of 1934, is known as the Public Company Accounting Reform and Investor Protection Act, in the Senate, and the Corporate and Auditing Accountability and Responsibility Act, in the House. Directly related to the internal control section 404 (Management Assessment of Internal Controls) "requires the senior management of U.S public companies to issue a report assessing the effectiveness of the company's internal control over financial reporting". Moreover, the independent auditors of U.S. public companies are required to testify the effectiveness of internal control (Calderon et al., 2012, 20). Thus, the main objective of SOX was to improve the quality of financial reporting and strengthen investor confidence.

Some evidences suggest about the effectiveness of SOX however there are some that are not so confident. For instance, a definite statement about decreased number of frauds since SOX was enacted cannot be made "because the data might be the result of fluctuating media and SEC attention as the 2007-2008 financial crisis shifted focus away from financial reporting and fraud" (Willits & Nicholls, 2014, 43).

The enactment of SOX was triggered by the fraudulent cases mainly in the headquarters of the corporations. However, "multinationals are particularly vulnerable to fraudulent activity, as opportunities for abuse can increase when subsidiaries are maintained abroad" (Genaldi, 2002, 62). Ishijima (2014) described fraudulent cases involving subsidiary companies of JVC Kenwood Holdings (JK) and OkiDenki. There were several causes identified for fraudulent activities. Some of them are: underdeveloped internal audit and insufficiency of unified accounting treatment and monitoring. Ishijima concluded that the companies should improve the following points of internal control procedure: compliance system, operational procedures and business system, monitoring, improvement of human resources management.

In 2005 the Company Law provided new regulations concerning internal control conducted in corporate groups (article 330). In 2012 it was proposed to impose supervision obligation over subsidiaries by parent companies (Takahashi, 2013). In July 27, 2014 this regulation was seen into the Company Law. Currently, according to the Company Law of Japan (article 362/4/6) in order to ensure healthy business condition board of directors should take the responsibility for actions of its subsidiaries and establish internal control system and conduct it in the company including subsidiary companies as a tool for fulfilling supervision duties.

Sharia Compliant Internal Control

Looking back to the prior studies we can see that many researchers in one way or another have claimed and are claiming that conventional financial auditing is insufficient to fulfill the needs of the stakeholders of IFIs (Haniffa, 2010, Yaacob, 2012, Abdel-Karim, 1999, Kasim, 2013, etc.). That is because the main difference between conventional and Islamic financial

institutions is that the Islamic financial institutions must abide Sharia law. Sultan (2007) has also stated that the Sharia audit shares similar functions to the company audit, however they are focused more on the compliance of IFIs with Sharia principles and requirements. This means that the financial accounting and reporting conducted by IFIs should be developed and practiced in accordance with Sharia principles. This is a challenge for the accounting academics and practitioners, who are usually familiar only with Western theories and practices (Abdel-Karim, 1999).

Currently, "there is no mention of the appointment and responsibilities of a Sharia auditor *per se*, nor a specific definition of a Sharia audit, in any related acts or regulations" (Kasim & Sanusi, 2013, 11). Nevertheless, Yaacob (2012) defined Sharia audit in a following way: "Shari'ah [Sharia] audit is the examination of an IFIs compliance with the shari'ah, in all of its activities, particularly the financial statements and other operational components of the IFIs that are subjected to the risk of compliance including but not limited to products, technology supporting the operations, operational processes, the people involved in the key areas of risk, documentations and contracts, policies and procedures and other activities that require adherence to shari'ah principles". The objective of the Sharia audit given by AAOIFI (2010) is "to enable the auditors to express an opinion as to whether the financial statements are prepared, in all material aspects, in accordance with the fatwas, ruling, guidelines issued by the Sharia Supervisory Board of the Islamic financial institutions, the accounting standards of AAOIFI, international and national accounting standards and practices, and relevant legislation and regulations applied in the country where the Islamic financial institutions operates". Considering all of the above, the ultimate goal of the Sharia auditors is to ensure sound and effective internal control system, which follows the Sharia in a strict manner.

There are four key players in the process of internal control of IFIs:

1. *The Audit and Governance Committee of the IFIs* or simply Audit Committee plays a significant role in the process of achievement of fundamental objectives of the IFIs, enhance greater transparency and disclosure in financial report and to gain the public's confidence of the IFIs regarding the application of Sharia rules and principles. The followings are the responsibilities of Audit & Governance Committee listed by Kasim, et al. (2013): (1) preserving the integrity of the financial reporting process, (2) safeguarding the interest of shareholders, investors and other corporate stakeholders, (3) providing additional assurance on the reliability of financial information presented to the board of directors, (4) acting as an independent link between the IFIs' management and its stakeholders, (5) comprehending the major risks to which the business is exposed, (6) monitoring management's control consciousness as it relates to the significance attached to controlling the IFI's policies, procedures and methods, (7) reviewing resources and skills, scope of responsibilities, overall work program and reporting lines of internal audit, (8) reviewing the findings of central bank inspection and other regulatory bodies together with management responses and ensuring that appropriate actions have been taken to comply with the central banks inspector's requirements, (9) reviewing the IFI code of ethics and effectiveness with which it is implemented.

2. Every IFI has to have *Sharia Supervisory Board (SSB)* (the only exceptions are IFIs of Iran, where Sharia compliance is controlled by the central bank) (Grais & Pellegrini, 2006). SSB is the most important governance structure which ensure compliance with Sharia. "In principle, the role of the SSB covers five main areas: certifying permissible financial instruments through fatwas (ex-ante shariah audit), verifying that transactions comply with issued fatwas (ex-post shariah audit), calculating and paying Zakat, disposing of non-shariah compliant earnings, and

advising on the distribution of income or expenses among shareholders and investment account holders" (Grais & Pellegrini, 2006). The main role of the SSB is to formulate fatwas and review process aiming to provide a common position in economics, finance and banking (Hamza, 2013).

3. *Internal auditors* conduct internal audit and ensure that IFI comply with Sharia and all transactions and that contracts are executed within the Sharia framework.

4. *External auditors* give opinions whether the transactions and contracts are within the Sharia policies, rulings and guidelines.

Being a relatively young system the Sharia audit is facing a number of challenges. Kasim, et al. (2009) have researched and found that there is a significant gap between the "desired" and the "actual" practice of Sharia auditing in IFIs in Malaysia. The authors have questioned a group of people directly or indirectly involved in Sharia audit. It was stated that: (1) although AAOIFI and IFSB are working on constructing Sharia auditing standards, there is still a great lack of standards and guidelines; (2) the scope of Sharia audit is limited to conventional financial audit; (3) professionals tend to have knowledge only in one of the two required qualifications; (4) there is a heavy dependence of Sharia auditors on the management of the Sharia unit.

And so, according to prior studies, there are four major issues and challenges concerning Sharia audit (Kasim, et al. 2009, Kasim & Sanusi, 2013, Yaacob & Donglah, 2012, Yaacob, 2012, Uddin, et al. 2013):

Framework of Sharia audit

Unregulated accounting policies for Islamic financial institutions resulted in development of various accounting policies by almost every IFIs. Variation in accounting policies across IFIs can create obstacles for comparison of the financial statements and weaken credibility of the IFIs in the eyes of international market players (Abdel-Karim, 1999). The traditional auditing theory and practice is ingrained in the Western secular capitalist framework. Although there is no doubt that techniques of secular capitalist systems would be used in Islamic economic system, existing fundamental differences between these two systems demand capitalist system techniques in Islamic approach to undergo a "basic metamorphosis".

Multiple authors researching Islamic finance claim that there is a vital necessity in well-established international standards for Islamic financial industry. Currently, Islamic finance is going through period of formation when the lack of standardization is one of the major challenges.

"Standardization means establishing universal Shari'ah [Sharia] standards possibly through a 'flexible "codification" of the Shair'ah principles and precepts" as suggested by McMillen (2010), which would eliminate the need for individual decisions by Shari'ah scholars, thus reducing the problems of the shortage of Shari'ah scholars and the divergence of Shari'ah interpretation" (Ghoul, 2011, 2).

The community of Islamic banks started an intensification of the standardization process of regulation and control. The Islamic development bank played a leading role in designing acceptable international standards and procedures. A list of other international organizations such as the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI), the Islamic Financial Services Board (IFSB), the International Islamic Financial Market (IIFM), as well as the Islamic International Rating Agency (IIRA) are also working on establishment of Sharia compliant standards and harmonizing them among the countries (El Corchi, 2005).

One of the leading organizations designing standards for Islamic financial institutions was established in 1991 as the Financial Accounting organization for Islamic Banks and

Financial Institutions (FAOIBFI) and renamed to the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) in 1995. The motivation behind the establishment of AAOIFI was driven by demand for financial reporting that would be in accordance with Islamic finance rules and requirements. The AAOIFI's standards are designed to be applied for financial transactions of Islamic financial institutions and to bring clarity to accounting and auditing treatments of these transactions. AAOIFI has already achieved certain expertise in developing accounting and auditing standards, nevertheless it has no power *de jure*. This means that standards cannot be enforced. The countries should adopt them by will. "With its voluntary adoption ethic, AAOIFI still faces a challenge to convince jurisdictions." (Alim, 2014, 169). Countries where AAOIFI standards have already been accepted as mandatory or desirable are: Bahrain, Malaysia, UAE, Saudi Arabia, Lebanon, Syria, Sudan and Jordan (El Corchi, 2005).

The IFSB was established in Kuala Lumpur in 2002 "in response to the growing significance of the Islamic financial services industry in many countries, and with the purpose of promoting, disseminating, and harmonizing best practices in the regulation and supervision of this industry…" (IMF news brief No. 02/41). The *raison d'être* of IFSB is similar to AAOIFI's – to build a stable Islamic financial industry by designing Sharia compliant standards. The difference between these two organizations is that "IFSB is the international standard-setting body of regulatory and supervisory agencies whereas AAOIFI's standards serve the needs of market players, such as Islamic banks and other financial institutions." (Alim, 2014, 174).

Scope of Sharia audit

The scope of auditing in the Islamic framework is much larger as compared to the scope of traditional auditing, and the expanded role of the Islamic auditor is derived from the basic values of the Islamic society. The Sharia audit scope should cover ""social behavior" and performance of organizations including their relationship with all the stakeholders" (Yaacob & Donglah, 2012, 225). Inaction and pliancy of the IFIs nourish a slowdown in standards setters' and regulatory bodies' performances. Currently, there is a "lack of expertise, specification and definition on the scope of shari'ah auditing practice" (Kasim, et al. 2009, 133), and the scope is depending solely on Sharia advisors and SSB (Yaacob & Donglah, 2012).

Qualification of Sharia auditors

"The Shariah [Sharia] Audit function is to be performed by internal auditors who have adequate Shariah-related knowledge and skills. Their ultimate goal is to ensure a sound and effective internal control system for Shariah [Sharia] compliance" (PWC, 2011, 10). Nevertheless, research conducted by Kasim, et al. (2009) have shown that there is a considerable gap in the knowledge about accounting science of those with Sharia qualification and vice versa. Another words, those with accounting qualifications usually do not have or have weak Sharia qualifications, and those with Sharia qualifications usually do not have or have weak accounting qualifications. Research conducted by Kasim & Sanusi (2013) also confirmed this statement. According to Yaacob (2012) this issue has been discussed since the early 70s. A number of researchers claim that to be able to audit and fully understand the activities of IFIs a good knowledge of Sharia and accounting is crucial for the Sharia auditor (Uddin, et al. 2013; Khan, 1985; Yaacob, 2012; Kasim & Sanusi, 2013). Khan (1985) stated that there are certain requirements for Sharia auditors: (1) accounting, business organization and finance; (2) theory and practice of management; (3) Islamic fiqh (Islamic jurisprudence) and usul al-fiqh (Islamic

legal theory), at least, those portions of fiqh dealing with business and commerce; (4) auditing, theory and practice. Yaacob (2012) added to this list also a strong Arabic and English fluency.

Independence of Sharia auditors

There are three major factors that significantly contribute to the degree of auditor independence: (a) clarity of definition of the auditor's responsibilities, (b) the position of the auditor within the organizational structure of the institution, and (c) the reporting authority for audit results (Grais & Pellegrini, 2006). Similarly, the only way to achieve faithful, unbiased Sharia audit reports is to provide and protect total independence of Sharia auditors. Currently, it is common for auditors to follow the guidance of, for example, SSB, which many researchers find unacceptable (Uddin, 2013; Kasim & Sanusi, 2013; Yaacob, 2012, etc.). It also should be noted that SSB members are also under the pressure of the IFIs and at the same time they long for maintaining their reputation. Kasim & Sanusi (2013) think that to solve this problem IFIs must draw a clear line of responsibilities among key players in the internal control process. This would help "to avoid the misperception of the stakeholders on the SSB and/or Sharia auditors' independence" (Kasim & Sanusi, 2013, 15).

"Noncompliance with shariah [Sharia] principles is an area of risk for IFIs that could translate into legal, image, and reputational risks, which would have far-reaching consequences not only for the individual IFI but also for the entire Islamic financial system" (Haniffa, 2010, 1-2).

Uniqueness of Islamic Finance in Non-Islamic Environment

"The prerequisite for an effective Shari'ah [Sharia] audit is a well thought-out Shari'ah [Sharia] review process" (Hussan, et al. 2013, 132), which is incomplete due to various reasons. One of those reasons, specific risk for Islamic financial industry, namely Sharia non-compliance risk, has already been discussed. Nonetheless there is a unique risk related only to Islamic finance called risk of non-compatibility of Islamic doctrines in IFIs. This section is dedicated to this risk.

It is generally accepted that in the Islamic financial system unified rules are extremely hard to achieve, because "the differences are not just between regulators but also between practitioners" (Pasha & Y-Sing, 2010). According to Ayub (2007), although, a large number of experts consider that different Sharia interpretation is a major issue impeding the development of Islamic finance, the major Sharia related issues have been clarified by the jurists. However this does not mean that certain Sharia interpretation issues are no longer present. "Diversity of opinions among the Sharia scholars that compose the religious councils could be one of the greatest challenges to be raised by Islamic finance" (Hamza, 2013, 230).

The source of dynamism and innovations in Islamic financial industry is the flexibility of fiqh opinions. Nonetheless, Sharia interpretations by various independent scholars causes inconsistencies in fatwas issued by SSBs. Sharia is defined as a "revealed divine law in Qur'an and Sunna" (El-Gamal, 2006). However, Sharia is also a subject to various interpretations depending on the context in which it is applied. Every IFI has its own Sharia board, members of which may attend several IFIs. However, despite this fact, there is a strong inconsistency among them. Different schools of thought (the Shiah branch and the Sunni branch, which includes the Madhahib, Shafie, Hanafi, Hanbali, and Maliki schools) possess different points of view on the same subjects. Variations of opinions of Sharia board members can be linked to differences of

schools of jurisprudence, national and cultural environments of the members. "The diversity of backgrounds and the different schools of jurisprudence of SB (shari'ah board) members as well as the regional context and national regulatory environment in which the members of the SBs function can create inconsistency in the interpretation of shari'ah [Sharia] and may thus prevent the harmonization of product and financial operations" (Hamza, 2013, 227).

Grais & Pellegrini (2006) have identified five issues of corporate governance related to operational activities of SSB: independence, confidentiality, competence, consistency, and disclosure. The contents of "consistency" issues are directly related to the Sharia interpretation for uniformity concerns. Essentially, the functions of SSBs are to construct a jurisprudence by the interpretation of Islamic legal sources. SSB is not a single international board. As it was mentioned before, SSBs exist in every IFI. Logically, there are various conflicting opinions about certain Islamic financial transactions and instruments.

DISCUSSION

The Ajinomoto Indonesia case presented in the introduction part of this paper is not directly, however, closely related to Islamic finance. That is because the company produced goods which were meant to be Sharia compliant. Unfortunately, overlooking only one of the ingredients caused large losses for both subsidiary and parent companies. This case demonstrated two things: how performances of subsidiaries may affect parent companies and risks associated with Sharia compliant products. Assuming if this misconduct occurs in a subsidiary involved in Islamic finance, the consequences would be even more devastating.

This paper addresses the problem of the internal control of the Japanese subsidiary companies involved in Islamic finance. Based on the evidences from previous researches this paper builds an argument promoting the necessity of conducting such kind of internal control, the purpose of which is to minimize the risks of non-compliance with Sharia.

In support for this argument the following major points have been researched in this paper: growth of Islamic finance, development of Islamic finance in Japan, problems of internal control, internal control of subsidiary companies, Sharia compliant internal control, and unique risk of Islamic finance.

Japan is the country showing a strong interest in Islamic financial industry. However, since the Muslim population of Japan is very insignificant, the development of Islamic finance domestically is a matter of a long term. Moreover, the Japanese banking regulation forbids banks to buy products, which disturbs development of Islamic finance in Japan. Nevertheless, by enacting an Amendment on the Enforcement of Banking Act, currently, only subsidiaries of Japanese banks can provide Islamic financial services.

In view of this to clearly understand risks of subsidiary companies and parent-subsidiary relationships, the internal control of subsidiaries has been reviewed. It has been found that the internal control of subsidiaries demands more attention *per se*. Why? Because subsidiaries of multinational companies are more exposed to such risks like fraudulent activities and misconducts, simply owing to the fact that the there is a distance between the parent company and subsidiary. Moreover, the effectiveness of SOX, the act passed after a number of fraud scandals, is still under question. In connection with the mentioned above in Japan parent companies are required to perform the role of supervisors by conducting an internal control in subsidiary companies.

However, it should not be forgotten that Islamic finance differs from conventional finance. There is a number of differences, which could be combined into one, - Sharia

compliance stipulation peculiar only for IFIs or companies involved in Islamic finance. The internal control known for conventional financial system does not inspect Sharia compliance of financial transactions or products. Consequently, even if Japanese parent companies are to conduct an internal control in their subsidiaries, the results of such control in subsidiaries involved in Islamic finance will have no solid power. Therefore the Islamic internal control or Sharia audit is being conducted in IFIs.

Nevertheless, as it has been cleared in the literature review section of this paper, that Sharia audit being part of a newly emerging financial industry in the global scale has to face many challenges. Despite the fact that only four challenges have been identified by many researchers, they are covering a wide range of issues, causing considerable gap between the "desired" and the "actual" practice of Sharia auditing. Furthermore, the conditions for an effective internal control described by COSO demands all seventeen principles of internal control to function in an integrated manner. In the current state of Sharia audit certain principles are not fully followed. For example, the fifth principle of the first component, control environment, states: "the organization holds individuals accountable for their internal control responsibilities in the pursuit of objectives". Unfortunately, responsibilities of the key players of Sharia internal control are still not well defined. This leads to dysfunction of the fifth principle of control environment component.

In addition, Islamic finance, which as a definition itself differs from conventional finance, has a certain peculiarity. This peculiarity is based on the fact that the foundation of Islamic finance is a religion, Islam. Islam just as any other religion has various schools of thought. Major schools of thought possess distinctive authority active for their followers. Scholars of these schools give interpretations of Sharia, which do not always coincide one with another. In account of this it might be impossible to completely unify Sharia standards. In other words, discussions about Sharia interpretations will be present regardless of standardization progresses.

All countries aim for unification of standards through an active work of international organizations. Nevertheless, countries with an Islamic background are more prepared for this feature of Islamic financial industry whereas countries with a non-Islamic environment are not in the favor of flexibilities, which cause inconsistency in applications.

Finally, Islamic finance is rapidly growing in the world as well as in Japan. Building an effective Islamic internal control system for Japanese companies now will become a strong foundation of the industry in the future.

CONCLUSION

In this work, I have investigated the necessity of an Islamic internal control in Japanese subsidiaries by parent companies. This study examined the related literature review and found that traditional internal control as we know it is not sufficient for examination and justification of Islamic financial transactions.

After an overview of the purpose, motivation and contribution in Chapter One and examination of the brief history and development of Islamic finance in the world and in Japan in Chapter Two, Chapter Three examined internal control and differences between conventional and Islamic finances.

In more details, section 2.1 examined how fast Islamic finance as a global industry is growing and its perspectives. Section 2.2 investigated development of Islamic finance in Japan, it was discovered that there are certain complications for its development domestically. However,

demand by Japanese companies triggered certain legal amendments allowing investments in Islamic financial transaction by Japanese banks' subsidiaries.

Section 3.1 discussed about the internal control, companies with fraudulent activities, measurements taken to decrease fraud and mismanagements (SOX) and doubts about effectiveness of these measurements. It has been found that controlling subsidiaries is more onerous because of the distance from the headquarters. In this section it specified that Japanese parent companies are required to conduct internal control in their subsidiaries thereby performing the role of supervisors.

Section 3.2 examined features and thereby differences of Islamic internal control or Sharia audit from conventional. This section described reasons why in addition to commonly known internal control there is a necessity to conduct Sharia audit.

Section 3.3 researched another feature of Islamic finance and how different its acceptability can be in a non-Islamic environment. Various interpretations of different schools of thought in Islamic finance are not a novation for the Islamic world, however conventional society will not accept inconsistencies such as that.

As it was observed from this research, Japanese companies hold a significant interest in developing and implementing Islamic finance, which due to legal issues can only be implemented by subsidiaries, however considering that internal control of subsidiaries demands more attention, and Japanese parent companies are required to supervise their subsidiaries, on top of that Islamic financial transactions cannot be audited by simple audit system, I conclude that Japanese parent companies should conduct an Islamic internal control in their subsidiaries which are performing Islamic financial transactions in order to minimize the risks of Sharia non-compliance.

A major limitation of this research work is the lack of literature. In Japan Islamic finance started developing only at the beginning of the XXI century. Legal amendments allowing subsidiaries to deal with Islamic products were enacted in 2008. Naturally, not many research papers have been written about this topic during such a short period of time. Additionally, a motivation for this study is the case of Ajinomoto Indonesia, which is not Islamic finance related. The thesis statement was constructed around of an assumption starting with "what if": what if a situation similar to Ajinomoto Indonesia would have occurred in a subsidiary with Islamic finance involvement?

Much research also remains to be done on estimating the cost of implementation of such internal control by Japanese parent companies and identifying challenges and issues of Islamic internal control process specific for Japanese companies.

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AN EXAMINATION OF THE EFFECT OF DEMOGRAPHIC VARIABLES AND PERSONALITY TRAITS ON STUDENTS' VALUATIONS OF JOB CHARACTERISTICS

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ABSTRACT

One of the important duties of faculty is advising students on courses and careers. Undergraduate students often have little information on what factors they might consider in selecting a career or how they might weight these factors. This paper reports the results of a survey of undergraduate students on their preferences with respect to job characteristics and analyses the relationships between student preferences and their demographics and personality traits. This information can be useful to faculty and students during advising on career planning.

INTRODUCTION

The AICPA predicts record demand for accounting graduates (Schiavone 2013). The Bureau of Labor Statistics (Bureau of Labor Statistics 2016a) predicts an 11% annual growth rate in accounting jobs over the period 2014 to 2024, faster than the average for all types of positions. The unemployment rate for those with a BA in general was only 2.5 % in December 2015 (Bureau of Labor Statistics 2016b). Jobs are and should continue to be available to accounting graduates. Thus graduates need not take the first job they can find, but can try to match job characteristics to personal needs and desires. How can students determine what type of position would best suit them? Some students will have had an internship before graduation, but many will not (Fesler & Caldwell 2000). Additionally, an internship provides limited information on the range of positions possible for graduates. If the internship is in public accounting, students will not be well versed in the characteristics of a position in industry. If the internship is in a small firm, characteristics will differ from those in a large firm. If in a stable industry characteristics may well differ from those in a growth industry. Even within a firm, job requirements can vary from reporting numbers and performing analyses to dealing with ad hoc problems. What should students use to differentiate among jobs? Those without an internship experience may only have experience in a retail or restaurant job. According to some research (Billiot, et al. 2004; Laufer & Crosser, 2004), one reason students do not choose accounting is a lack of knowledge about the nature of the work. Laufer & Crosser (2004) found that accounting students in general lack knowledge of how to make basic career decisions. Most had limited or inaccurate knowledge about different accounting careers available to them. Laufer & Crosser (2004) charge faculty with not only teaching basic accounting skills, but also with the responsibility of helping inform accounting students of their career options. Other studies also indicate a lack of knowledge about careers on the part of accounting students (Violette & Chene 2012; Simons, et al. 2003; Kaye, 2014). The AECC Issues Statement No. 5 (AECC 1993b)

suggests that faculty should communicate information about the "conditions of practice" to students as part of guidance and advising.

Thus, faculty responsibility for advising includes not just advising for class schedules, but also advising for career planning. With limited experience and knowledge it may be difficult for students to determine how to choose a career path. Faculty can play a role in helping students recognize what factors they might consider and what best fits their personal goals and preferences. Faculty is likely to have useful knowledge in this area due to their work in teaching and their maintenance of professional credentials. Faculty, in maintaining professional qualifications such as a CPA, a CMA or a CIA, are required to invest in continuing professional education (AICPA 2001; IMA 2013; IIA 2015). This can involve courses offered by the professional organizations, sessions in professional meetings and academic conferences, or university training and courses. Faculty is also called upon to develop their knowledge of their profession for academic accreditation of their respective schools (e.g., AACSB 2013; SACSCOC 2006, 2012) through attending similar meetings/conferences and/or publishing in their field. Faculty may also participate in an accounting or business advisory board that helps their school remain professionally informed, and consequently meet and talk with those currently employed in the accounting profession. The Accounting Education Change Commission (AECC) of the American Accounting Association recommends that faculty members develop a "high level of knowledge about both practice issues and the nonacademic accountant's workplace", "interact with practicing accountants" and "communicate knowledge about the conditions of practice to students." (AECC 1993a). These, as well as prior employment in the area or current consulting engagements, can all provide knowledge and experience relevant to career advising.

This study examines the effect of demographic and personality traits on students' valuation of job characteristics. The objective of this research is to help faculty advice students on career planning by demonstrating links between student characteristics, which faculty advisors may know firsthand from the classroom or can try to determine in discussion with advisees, and the range of job characteristics these advisees might consider in their job search.

BACKGROUND

Is a high salary or a flexible schedule more preferable? What is more important, a 401(k) plan or a pleasant work environment? These are some questions accounting students could consider. Faculty experience and education can play a role in helping students prioritize job characteristics. There is some information on accounting student job preferences. Phillips & Phillips (2006) conducted a survey of accounting students to determine what they found important in a job search. Job security and advancement opportunities were ranked as the top two choices, while day care and gym facilities were the least desired. A more recent study (Bagley et al 2013) found that there were differences in the importance of job characteristics when students were grouped by those seeking jobs with Big Four firms and those seeking jobs with non-Big Four firms. One difference the authors found was that those seeking a job with a Big Four firm ranked salary as the most desired factor and tone of the firm as the least desired factor. Students preferring a job at a non-Big Four firm ranked work-life balance as the most desired factor and recognition of working for a prestigious firm as the least desired factor. Bagley, et al. (2013) provides information that can help faculty in this process. They found that current accounting professionals felt the advantages of working in a Big Four accounting firm were prestige, larger clients, networking/future job opportunities, compensation, and better resources/training. These professionals identified the advantages of working at a non-Big Four accounting firm as a more

comfortable work environment, more diverse experience, fewer hours, less travel, and closer client relationships. The authors note that faculty can provide valuable information to students in deciding what factors are most important in their career planning.

However, there isn't much information on how personality characteristics affect preferences for job characteristics. This led to the current study. It investigates links between what is most important to students as they prepare to enter the workforce and student demographics and personality characteristics. The goal is to help faculty understand how student traits may affect what is attractive in a job.

Faculty Advising

Faculty can have an impact on a student's decision to major in accounting and the particular type of career that student chooses. Past research has shown that a student's experience in the first accounting course has a significant effect on the perceived benefits of an accounting career (Chen 2008), and that business students in general have a high demand for career counseling (Lin and Chang 2007). Faculty can offer guidance to students in determining what factors are important when identifying a career. This study is from a student perspective rather than from an accounting professional's perspective, and can aid faculty in discussing a range of factors that may be important to students seeking employment so they can properly identify their preferences when making career decisions.

For respondents in this study, it appears that (see Table 1) faculty influence on the selection of accounting as a major is fairly small. The current study allowed students to mark all factors that influenced their choice of major, but only a small percentage indicated faculty as an influence. Given faculty experience and skills, this may indicate an opportunity for faculty to help students recognize a career in accounting as a possible choice.

Table 1
INFLUENCES ON CHOICE OF ACCOUNTING AS A MAJOR

Influences: Choose all that apply	Regional University (% of Regional Students)	IMA's Student Leadership Conference (% of IMA Conference Students)	Total Number of Students
Faculty encouragement	9 (10%)	33 (21%)	42
Interest in the nature of the work	52 (55%)	101 (63%)	153
Likelihood of finding a job	48 (51%)	96 (60%)	144
Parent or peer influences	22 (23%)	38 (24%)	60
Potential for advancement	25 (27%)	76 (48%)	101
Potential salary	46 (49%)	88 (55%)	134
Total number of Students	94	160	254

RESEARCH DESIGN

Demographics

This study involved two groups of students, accounting majors at a regional AACSB accredited university and attendees at the IMA Student Leadership Conference.

Past research suggests that different demographic groups have different preferences when it comes to job characteristics. A study of Canadian graduates found that men tend to put more

emphasis on initial earnings while women care more about long-term earning potential (Boudarbat & Montmarquette 2009). Another study found that older accounting professionals tend to find their jobs more fulfilling than their younger counterparts (Moyes, et al. 2006).

For these reasons we decided to not only report students' desired job characteristics as a whole, but also examine different demographic subsets to see if certain types of students desire some characteristics more or less than other types. We divided the students into basic demographic groups (gender, age, financial dependents, etc.) to see if the groups differed in their ratings of job characteristics. To help faculty in advising and recruiters in attracting desirable candidates, we also divided the group by high/low GPA and asked basic personality questions to see whether these traits affected these preferences.

Personality

The personality questions were developed using the MBTI types (intuition/sensing, introversion/extroversion, feeling/thinking, perception/judging). The authors developed questions (statements with which to agree or disagree) in each category using phraseology related to business as much as possible. The resulting data was analyzed to find sets that varied together to form factors that could be described with a word related to a business career. The analysis found two distinct personality types (see Appendix A for the questions themselves). One was the entrepreneurial personality. We defined this personality as one who likes to try out new ideas, adapts to change quickly, likes to look at the big picture, and tends to focus on what is happening around them. The second was the analytical personality. This type of personality is one who likes to think in concrete terms, uses their head to make decisions, plans in advance, and likes to be in control of the situation.

DATA

Survey

We developed a survey to help us determine the factors that accounting student's value in a new job. The survey was piloted, with about a half dozen graduate students, to ensure clarity and to test the time required for the survey. It was given in class at the regional university, was voluntary for both groups of respondents, and also short to encourage students to complete it. The results of the pilot resulted in minor changes to the wording of the questions.

The first section of the survey elicited basic demographic information. Respondents were asked for their gender, age, and GPA. Respondents were also asked why they chose accounting as their major, their number of financial dependents, and if they were the first person in their family to attend college.

The next section of the survey had students indicate, on a ten-point Likert scale, how important certain job characteristics would be in their job choices. Zero was not at all important and ten was extremely important. The demographic information is presented in Table 2 below. The job characteristics listed were, in alphabetical order: benefits (e.g. health, life insurance, retirement plans), geographical location, job security/stability, long-term growth opportunities, nature of work (e.g. interesting, stimulating, challenging), salary, and work environment (e.g. culture, flexibility). These variables (mean, median) are presented in Table 3 below.

The final section was a personality assessment in which we listed fifteen basic personality statements and had respondents mark, on a ten-point Likert scale, how much they

agreed or disagreed with the statement (Exhibit A). Zero was strongly disagree and ten was strongly agree. An example of a personality statement is "I like to make my plans in advance rather than 'going with the flow.'" These responses were grouped, using factor analysis, and investigated as personality types. The factor analysis provided two clusters of questions, only related to an entrepreneurial style and one to an analytical style. Students were scored on both types, and the resulting variables used in the analyses.

The survey was given to students in upper-level accounting classes at a regional university and to students at an Institute of Management Accountants (IMA)'s Student Leadership Conference. This conference has many of the best accounting students from all across the U.S.

Regional University

The regional university is AACSB accredited. The survey was given to students in senior level classes (Auditing, Accounting Information Systems, and External Reporting) and to students in graduate level Masters of Accountancy classes (Advanced Accounting Information Systems and Accounting Theory). A member of the research team went to the classroom and gave a paper copy of the survey to each student. It was explained to the students that all results were anonymous and that participation was voluntary. Virtually all students filled out the survey and very few questions were left blank.

IMA's Student Leadership Conference

With respect to the students from the IMA Leadership Conference, of the 153 student chapters, 82 are at AACSB accredited universities. Most of the students at the conference were members of an IMA Student Chapter. This survey was the same as the one given at the regional university with one additional question added to determine the academic status of the respondent (e.g., junior, senior). This question was added to filter out lower-level accounting students and those who had already graduated. This left us with only upper-level and graduate accounting students, comparable to the group from the regional university. Each student at the conference received a copy of the survey in their registration packet with instructions on how to complete and return it.

The following (Table 2) shows the demographic information for the two groups. In order to ensure that the responses collected at the regional university and at IMA's Student Leadership Conference could be combined for analysis, we compared results for the two groups for each demographic question asked. The two groups were significantly different only in salary. However, there was a marginally greater percentage ($p<0.054$) of the students at the IMA conference with a high GPA than at the regional university.

Table 2
DEMOGRAPHICS

Demographic	Regional University	IMA's Student Leadership Conference	Total Number of Students
Females	49	96	145
Males	45	64	109
Total	94	160	254
Traditional (up to age 24)	74	121	195
Non-Traditional (over age 24)	18	35	53
Total	92	156	248
High GPA (>3.5)	35	79	114
Low GPA	59	81	140
Total	94	160	254
Any Financial Dependents	16	27	43
No Financial Dependents	78	134	212
Total	94	161	255
First Generation College	24	42	66
Not First Generation College	70	119	189
Total	94	161	255

DIFFERENCES BETWEEN GROUPS

The ratings of job characteristics (Table 3) were not statistically different for any job characteristics except salary, which was only marginally higher for the regional university ($p<0.08$). Personality factors were the only variables where there were significant differences between the two groups. There were significantly ($p<0.002$) more entrepreneurial personality types at the IMA's Student Leadership Conference than at the regional university. A possible explanation could be that a person who has an entrepreneurial personality type (likes to try new things, look at the big pictures, & focuses on what is happening around them) could be more likely to attend the IMA's Student Leadership Conference. Given this, all analyses were based on the combined data except for the analyses using the entrepreneurial personality type.

Table 3
RATINGS OF THE IMPORTANCE OF JOB CHARACTERISTICS

Median (mean) values of responses (Maximum value of 10)	Regional University	IMA's Student Leadership Conference	All Students
Benefits (e.g., Health/Life Insurance, Retirement Plans)	8.2 (8.5)	8.0 (8.0)	8.1 (8.0)
Geographical location	6.2 (6.0)	6.5 (7.0)	6.4 (7.0)
Job Security/Stability	8.7 (9.0)	8.6 (9.0)	8.6 (9.0)
Long-Term Growth Opportunities	8.7 (9.0)	8.5 (9.0)	8.6 (9.0)
Nature of Work (e.g., Interesting, Stimulating, Challenging)	8.1 (8.4)	8.3 (8.5)	8.2 (8.5)
Salary	8.3 (8.5)	8.0 (8.0)	8.1 (8.0)
Work Environment (e.g., Culture, Flexibility)	8.4 (8.5)	8.6 (8.8)	8.5 (8.6)

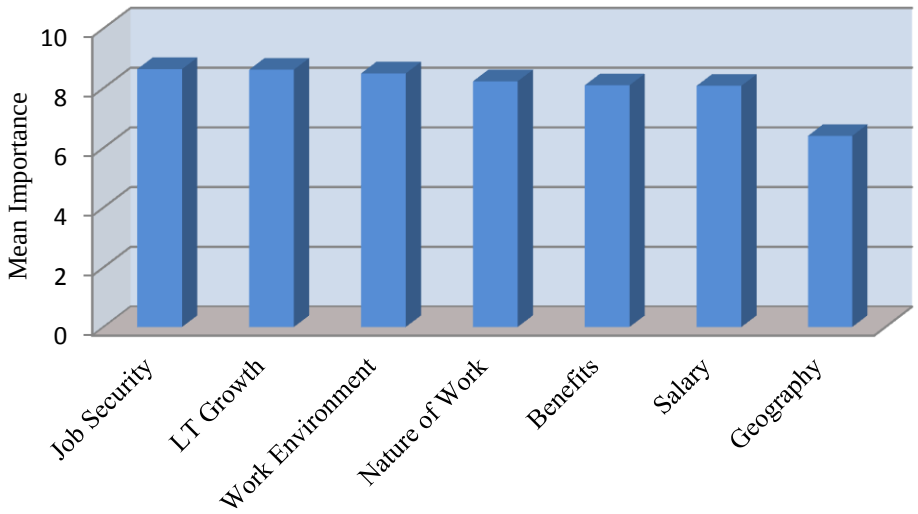
RESULTS & ANALYSIS

Job Characteristics

While one might think that salary would be the deciding factor for most students seeking employment, our survey shows (Figure 1) that upper-level and graduate accounting students' top two most desired characteristics are job security (mean 8.63) and long-term growth opportunities (mean 8.61). The three least desired characteristics are benefits (mean 8.09), salary (mean 8.07), and geography (mean 6.39).

When comparing salary to the other job characteristics, salary was valued significantly lower than work environment ($p<0.0001$), long-term growth ($p<0.0001$), and job security ($p<0.0001$). Salary was no differently valued than the nature of the work or benefits, but was valued significantly higher than geography. It appears that students are thinking long-term, and are concerned with job stability and advancement potential. Quantitative factors, such as salary and benefits, are not among the top priorities for these students.

Figure 1
Mean Ratings of Job Characteristics



Personality Type

When we examined the data by personality type, we found that those with a high entrepreneurial personality score rated several job characteristics significantly higher than those with a low entrepreneurial personality score. These were nature of work ($p<0.010$), work environment ($p<0.013$), and long-term growth opportunities ($p<0.027$). Salary was rated marginally higher ($p<0.065$). We also found that those who with a high analytical personality score rated several job characteristics significantly higher than those with a low analytical personality score. These were salary ($p<0.001$), work environment ($p<0.005$), job security ($p<0.008$), and long-term growth opportunities ($p<0.017$).

The entrepreneurial personality type included significantly more men while the analytical personality type did not differ by gender. Respondents from the IMA Student Leadership Conference with a high entrepreneurial personality score have significantly higher ratings for salary ($p<0.008$), nature of work ($p<0.029$), and long-term growth opportunities ($p<0.035$). Respondents from the regional university with a high entrepreneurial personality score are not significantly different in their ratings of these characteristics from those with a low entrepreneurial personality score, but rated work environment marginally higher ($p<0.068$).

Gender & GPA

Our study showed that women rated the importance of all job characteristics higher than men. However, the only significant difference was for benefits ($p<0.014$). Women ranked job security ($p<0.052$) and geography ($p<0.0997$) marginally higher than their male counterparts.

However, when isolating by high GPAs (greater than 3.5), female students' ratings were significantly higher for benefits ($p<0.004$), nature of work ($p<0.015$), job security ($p<0.035$), geography ($p<0.037$), and work environment ($p<0.041$) as compared to male students with a high GPA.

Table 4
MEAN RATINGS OF JOB CHARACTERISTICS BY GENDER (1-10 SCALE)

Job Characteristics	Female (145 Respondents)	Male (109 Respondents)
Job Security	8.73	8.51
Long-Term Growth Opportunities	8.63	8.61
Work Environment	8.58	8.36
Nature of Work	8.36	8.06
Benefits	8.35	7.74
Salary	8.16	7.97
Geography	6.63	6.06

Traditional/Non-traditional

We grouped respondents as traditional and non-traditional students. Students aged 25 and under were categorized as traditional and those older than 25 as non-traditional. Traditional students rated job security significantly higher ($p<0.02$) than non-traditional students. Non-traditional students rated geography ($p<0.06$) and nature of work ($p<0.09$) marginally higher than traditional students. Thus it appears that traditional students are more concerned with the stability of their job. This may be the result of current economic conditions: non-traditional students have seen favorable and unfavorable economic conditions during their lifetimes, while traditional students have only seen difficult times. Therefore, stability may be less of a priority for the non-traditional students. Non-traditional students care more about geography, perhaps because they are likely to have family-ties to their current location. A possible explanation for why non-traditional students rate nature of work higher is that they probably have more experience working and may have put more thought into the decision to come back to school and select a major they enjoy and are passionate about.

Financial Dependents

Respondents were asked to indicate their total number of financial dependents. The data showed that if a respondent had *any* financial dependents, all job characteristics were rated higher. Nature of work was rated significantly higher ($p<0.002$). Long-term growth opportunities ($p<0.054$), benefits ($p<0.065$), work environment ($p<0.08$), and job security ($p<0.09$), were rated marginally higher.

First Generation College Students

Our results showed that there were no significant differences in the rating of job characteristics by those who were first generation college students and those who were not.

Reasons for Selecting Accounting

The survey asked respondents what made them choose accounting as their major. The order of most to least selected answers were: interest in the nature of the work; likelihood of finding a job; potential for salary; potential for advancement; aptitude in the subject; parent/peer influence and faculty encouragement. This indicates that faculty encouragement is currently not a significant factor in student career choice.

IMPLICATIONS

For Faculty

Faculty can have a lasting impact on accounting students both inside and outside the classroom. Faculty is in a unique position to help students make career decisions that can significantly and positively affect their future. When advising, it is important that faculty initiate a discussion on what job characteristics are important to a student. Our research can help initiate that discussion. Faculty can also use our research to predict what characteristics might be most important given their knowledge of a student's personality and demographics. Knowing which job characteristics are important to a student can help faculty recommend a type of job that might best suit that student.

Students who value long-term growth opportunities and salary could be encouraged to look into employment with a large firm, while advisees valuing the work environment or geography might prefer a smaller firm. Students with an entrepreneurial personality find long-term growth opportunities, nature of work, and salary to be more important than other factors. Those with an analytical personality find long-term growth opportunities, work environment, job security and salary to be more important. Traditional students value job security more than non-traditional, while non-traditional students value geography and nature of work more. These preferences can be used while advising students on career paths.

In our study we found that faculty encouragement was the least chosen reason for students selecting accounting as their major. This is disconcerting and is something faculty can perhaps change, by discussing, both during advising and in the classroom, the many benefits an accounting career could offer a student and how different accounting careers have different characteristics.

For Employers

Finding and recruiting staff is important to accounting practices, and has been since 1997, according to the AICPA. The enactment of Sarbanes Oxley in 2002 has only further increased the need for qualified accounting staff (Finning 2006). Past research has found that campus recruiters are becoming an important factor in finding and attracting new accounting staff. The top three qualities recruiters look for are leadership potential, strong communication skills, and enthusiasm/motivation for the company (Violette & Chene 2008). A study by Van Hoye and Saks (2011) found that an employee's opinion of the attractiveness of a firm is affected by both instrumental factors (pay, job security, etc.) and symbolic factors (prestige, sincerity, etc.). It is important that firms consider how to attract the best candidate as they compete for talent. Knowing what characteristics students with an entrepreneurial or an analytical personality value could allow firms to emphasize the most appealing characteristics of their open positions. For those with an entrepreneurial bias, a firm could emphasize the increasing decision making freedom allowed as one progresses in one's career or the exposure to higher levels of management which can help an employee develops a broad view of the firm and its goals. For those with a more analytical preference, the recruiter could emphasize the scope of the data available for analysis, the provision of tools and reports for control purposes, and the expectation of a rational and well-supported approach to problem solving.

We found, through our literature review and discussions with accounting professionals, that hiring quality employees is a challenge. Since companies certainly want to hire the best candidates, they must keep in mind how to make the job appealing to those candidates. Our research provides information to help companies understand which job characteristics to emphasize to attract their top candidates. Knowing what job characteristics to emphasize during the hiring process will improve a company's chances of attracting and hiring the best candidate. Contrary to popular belief, salary is not necessarily the most important job characteristic to emphasize. Job security and long-term growth opportunities were found to be the most important job characteristics for many of our respondents. Discussing employee retention rates or the typical career path for employees can emphasize the job security and long-term growth opportunities of a career at a company.

Our results indicate that students looking for a job are more likely to be attracted to a company they believe to be a secure and stable place to work, that provides long-term growth opportunities and that has a positive work environment. While a company may have a standard offer for a specific position, knowing what organizational characteristics to emphasize can make a significant difference in its attractiveness to a particular candidate.

With respect to demographic characteristics, we found that females find the benefits a company offers more important than males. Females with high GPAs are more concerned with job security, nature of work, and benefits when looking for a job. With respect to age, if the ideal candidate is a traditional student, putting extra emphasis on the job security and stability of the company could be beneficial. Non-traditional students could be attracted by focusing on the specific work they would be doing and the amount of travel required.

LIMITATIONS & FUTURE RESEARCH

One limitation is that the job characteristics listed are very broad and may have different connotations for different students. Additionally, the personality factors were based on only a few basic questions and not on an extensive personality test.

Some interesting future research could be a comparison between how students in lower level classes and those in upper level classes value different job characteristics. One could also compare the ratings of job characteristics by students with that of current accounting professional, to determine if experience changes the ranking of the characteristics. Research could be done in different geographical areas or larger universities to see if different job characteristics are valued in different locations.

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Appendix A

This survey should take about 5 minutes, and will be used only for academic research. The responses are anonymous and you will not be identified in any way. Please answer these questions to the best of your ability.

Thank you so much for taking the time to complete our survey.

1.) Gender
   a. Male
   b. Female

2.) Age _____

3.) Cumulative GPA
   a. Less than 2.49
   b. 2.5 to 2.99
   c. 3.00 to 3.49
   d. 3.5 to 3.75
   e. Greater than 3.75

4.) Number of people, other than yourself, who are financially dependent on you:
   a. 0
   b. 1
   c. 2
   d. 3
   e. More than 3

5.) What made you choose accounting as your major? – Check all that apply
   a. Aptitude in the subject
   b. Faculty encouragement
   c. Interested in the nature of the work
   d. Likelihood of finding a job
   e. Parent or peer influences
   f. Potential for advancement
   g. Potential salary
   h. Other: Please specify _____

6.) Are you the first person to attend college in your immediate family?
   a. Yes
   b. No

Place an X <u>anywhere</u> on the number line that expresses your opinion of the importance of each of the following factors for your job choice:

Benefits (e.g. Health/ Life Insurance, Retirement Plans)

Geographical Location

Job Security/ Stability

Long-Term Growth Opportunities

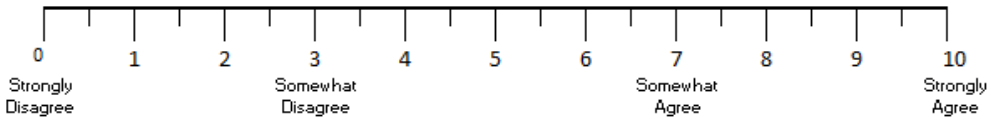
Nature of Work (e.g. Interesting, Stimulating, Challenging)

Salary

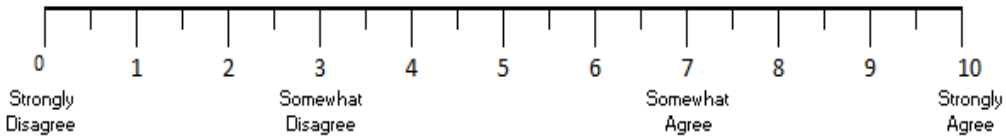
Work Environment, (e.g. Culture, Flexibility)

Place an X <u>anywhere</u> on the line where you feel best answers the question.

I like to look at the big picture rather than at the details.

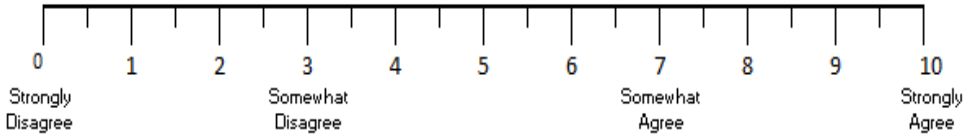


I like to make my plans in advance rather than "going with the flow."

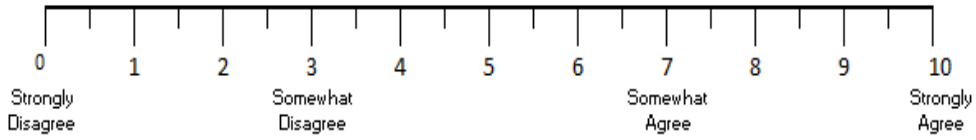


I tend to describe the world in imaginative rather than scientific terms.

I prefer to have a few deep friendships rather than having many casual friends.

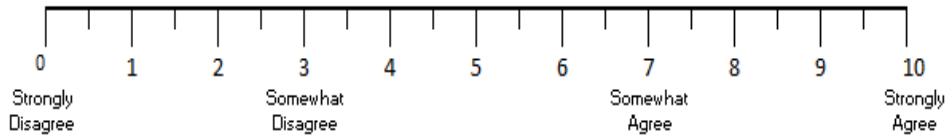


I prefer to have a method provided to me rather than having to create a new method.

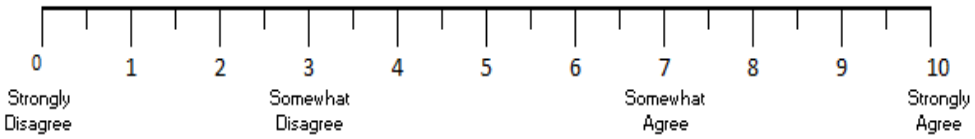


Place an X <u>anywhere</u> on the line where you feel best answers the question.

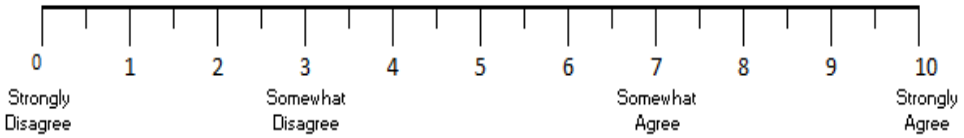
I prefer to use charts and graphs rather than read essays to understand information.



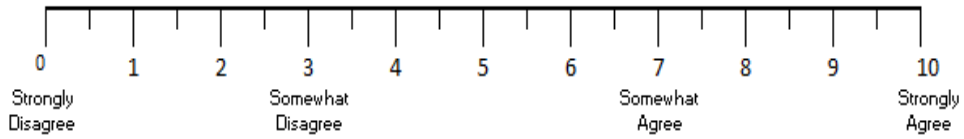
I prefer a job that has assigned hours rather than one where working extra hours is desired.



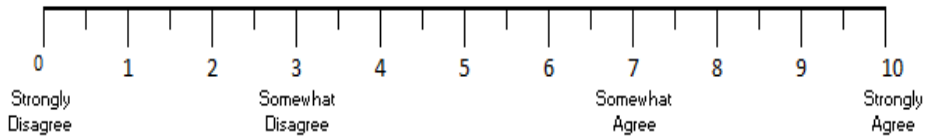
I prefer to use my head rather than my heart to make decisions.



I like to try out new ideas rather than doing things the established way.

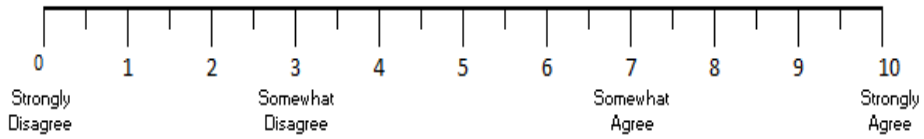


I like to be in control of making decisions rather than letting things simply happen.

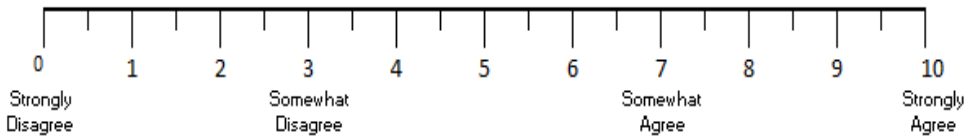


Place an X <u>anywhere</u> on the line where you feel best answers the question.

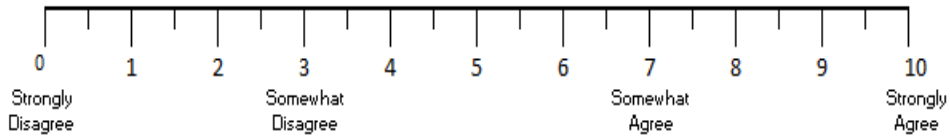
I adapt to change quickly rather than needing time to adjust.



I look for opportunities to be 'in-charge' rather than let others take the lead.

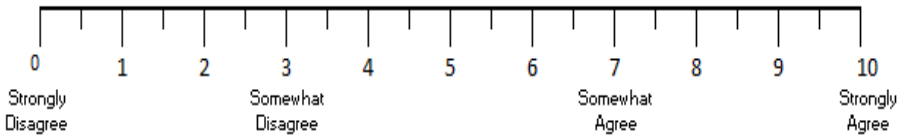


I tend to focus on what is happening around me rather than on what I am thinking.



I like to think in concrete terms rather than abstract terms.

I prefer to spend time alone rather than spending time with others.



DISENTANGLING THE IFRS 1 DISCLOSURE: OBSERVATIONS FROM THE EARLY ADOPTION OF IFRS IN CANADA

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ABSTRACT

The objective of this study is to investigate whether the method employed to analyze the implementation of International Financial Reporting Standards (IFRS) is consequential as to our ability to evaluate IFRS as a financial reporting vehicle. In this study, IFRS 1 reconciliations are deconstructed to exhibit the financial magnitude of optional exemption choices permitted under IFRS 1, standard-to-standard differences, and equity component switching. Findings from this study demonstrate that optional exemption choices and equity component switching comprise the larger part of the financial magnitude of IFRS adoption. Evidence from this study should prompt standard setters, regulators, practitioners, investors, and researchers to carefully consider how IFRS is being applied and the extent to which it is being adopted when assessing the standards for any attainment of relevance, quality, and comparability.

INTRODUCTION

Studies of International Financial Reporting Standards (IFRS) adoption have demonstrated an increase in accounting quality (Ball, Robin, Wu 2003; Capkun, Cazavan-Jeny, Jeanjean, Weiss 2008; Gassen and Sellhorn 2006). High quality financial reporting has demonstrated a reduction in information asymmetries for investors (Street and Bryant 2000; Tarca 2004; Ashbaugh and Pincus 2001; Gordon, Jorgensen, and Linthicum 2010). The International Accounting Standards Board (IASB) has designed standards intended to reduce information asymmetries amongst external users of the financial statements, primarily investors (Haller, Ernstberger, and Froschhammer 2009) and more broadly amongst countries (Barth, Landsman, and Lang 2008). However, any assessment of IFRS as a reporting vehicle should consider how the standards are applied (Kvaal and Nobes 2010; Schipper 2005) and the extent to which IFRS is adopted.

The research objective of this study is to employ disaggregation methods to investigate the implementation of IFRS. IFRS adoption is not a monolithic event. The implementation of IFRS entails management choices permitted under in IFRS *1 First Time Adoption of International Financial Reporting Standards*, remeasurement of all accounts in accordance with IFRS, and material reclassifications (equity component switching) of accounts within the statement of financial position. The transition to IFRS is a significant disclosure-enhancing event (Cormier 2013; Fifield, Finningham, Fox, Power, and Veneziani 2011; Karamanou and Nishiotis 2009) and as such any evaluation by standard setters, regulatory agencies, practitioners, and researchers of the IFRS global framework should carefully consider management discretionary choices as well as pronouncement differences upon transition to IFRS. Due to the complexity of disentangling the IFRS 1 disclosure, the current body of literature is limited as to studies which disaggregate the IFRS transition by IFRS 1 choices, standard-to-standard differences, and equity component switching (material reclassifications).

This study examines the transition to IFRS by voluntary adopters in Canada. Canada provides an interesting platform for the study. Effective January 1, 2011, the Canadian Accounting Standards Board (AcSB) required all Canadian Publicly Accountable Enterprises (PAE) to adopt IFRS for financial reporting. With the 9th largest economy based on Gross Domestic Product (GDP) (Economy Watch, 2012), Canada is a formidable economic force and presents an opportunity to examine the implementation of IFRS in a large market-oriented economy. Canada also provides an optimal setting to examine a country with long-term convergence efforts as a precursor to the transition. Prior research has investigated country contexts which are divergent from IFRS (Cormier, Demaria, Lapointe-Antunes, and Teller 2009; Hung and Subramanyam 2007; Lantto and Sahlström 2009). Finally, the Canadian transition to IFRS is of vital importance to the Financial Accounting Standards Board (FASB), the Securities Exchange Commission (SEC), and U.S. constituents as Canadian GAAP was closely aligned with U.S. GAAP.

Empirics are presented which disentangle the financial magnitude of implementation choices, GAAP-to-GAAP differences, and equity component switching. Data hand-collected from IFRS 1 reconciliations reveal business combinations, share-based payments, and cumulative translation differences as the optional exemption choices most frequently exercised by sample firms. The financial effect of the cumulative translation difference resulted in an overall decrease to retained earnings of $13.4 million for firms in the sample. (All amounts are reported in Canadian dollars.) In sample, firms experienced an average decrease to retained earnings of $1.2 million per firm. The analysis of pronouncement differences revealed IFRS 2 *Share-Based Payments* and IAS 12 *Income Taxes* as the standards having the most frequent effect on sample firms. The largest re-measurement effect on total stockholders' equity was a result of the application of IAS 16 *Property, Plant, and Equipment*, IAS 40 *Investment Property*, and IAS 12 *Income Taxes* at an increase of $19.6 million, an increase of $4.9 million, and a decrease of $6.7 million, respectively. For all sample firms, the change in total stockholders' equity as reported totaled $16.4 million. However, disaggregation methods revealed that $13.6 million of the total adjustment to stockholders' equity was attributed to equity component switching which decreased retained earnings and bypassed the income statement.

In Henry's 2009 study of SFAS 159 *The Fair Value Option of Financial Assets and Liabilities*, firms avoided recognition of realized security losses on the income statement by using the adoption of the provision to report the re-measurement to fair value as an adjustment to the opening balance of retained earnings. Employing this finding analogously for the transition to IFRS coupled with the evidence provided in the present study, these findings may alert standard setters and regulators as to opportunistic equity component switching under the veil of IFRS adoption.

As evidenced by the present study, optional exemption choices and equity component switching comprise the larger part of the financial magnitude of IFRS adoption. Evidence provided in this study demonstrates how optional exemption choices selected by first-time IFRS adopters conceals the impact of IFRS which may compromise the comparability objective of the IFRS Conceptual Framework (IASB 2010). Disaggregating the implementation of IFRS should be of interest to standard setters and regulators as a critical technique to assess how IFRS is being applied and which aspect of the implementation of IFRS – IFRS 1 optional exemption choices, standard-to-standard differences, or equity component switching bears the greatest financial impact of IFRS adoption. Understanding the true effects of IFRS are crucial as standard setters, practitioners and firms weigh the benefits of IFRS against the costs of adoption.

The remainder of this study is organized as follows. The next section discusses IFRS 1. The following section describes the data collection and sample. The following section presents analyses of equity components. The last section concludes the study.

IFRS 1

Authoritative Guidance

IFRS 1 *First Time Adoption of International Financial Reporting Standards* sets the precedent for financial reporting under IFRS, overrides transitional provisions included in other IFRS, and prescribes detailed disclosures. The IFRS 1 disclosure entails detailed reconciliations and explanations of the transitory financial effects from Canadian GAAP (CA GAAP) to IFRS.

IFRS 1.39 requires the first IFRS financial statements to include a reconciliation of equity reported under national GAAP to equity under IFRS at the date of transition to IFRS and at the end of the latest period for comparative information presented in the first IFRS financial statements. For this study, the reconciliation of equity is of particular interest. According to IFRS 1.40, the reconciliations have to be sufficiently detailed in order to enable users to understand the material adjustments to the balance sheet and income statement.

IFRS 1 requires entities to apply, retrospectively, all IFRS standards effective at the end of their first IFRS reporting period. The standard requires the opening presentation of IFRS statement of financial position and the comparative financial statements be prepared in accordance with the recognition, measurement, presentation and disclosure requirements of these standards. The Canadian Securities Administrators (CSA) requires the presentation of an opening IFRS statement of financial position in the first IFRS interim financial report. In the opening statement of financial position, a Canadian company must:

- Recognize all assets and liabilities required by IFRS
- Derecognize all assets and liabilities not permitted by IFRS
- Classify all assets, liabilities and components of equity in accordance with IFRS; and
- Measure all assets and liabilities in accordance with IFRS

All adjustments, when applicable, should be recognized through retained earnings, or other equity items, at the transition date (CICA 2011).

IFRS 1 also establishes two categories of exceptions to the retrospective rule: mandatory and optional exemptions. Mandatory exemptions prohibit retrospective application of IFRS due to insufficient measurement reliability.Optional exemptions grant relief from IFRS requirements in which the costs of compliance exceed the benefits to the users of the financial statements. The optional exemptions represent choices of accounting policies under IFRS which may have significant impact on an entity's future financial results (Jermakowicz and Gornik-Tomaszewski 2006).

Optional Exemption Choices

As previously mentioned, firms adopting IFRS must comply with IFRS 1. IFRS 1 permits the election of exemption choices in specific areas where the cost of complying with IFRS 1 may exceed the benefit to financial reporting or where retrospective application is impractical. For example, at the transition date to IFRS, IFRS 1 permits firms to elect to maintain assets at historical cost, a previous GAAP valuation, or remeasure assets to fair value. If a firm exercises the option to remeasure a property, plant, or equipment asset to fair value, the fair value would surrogate for the historical or depreciated cost of the asset as the deemed cost at the transition date. These exemption choices represent compromises of the IFRS measurement system upon adoption. Any compromises of the IFRS system upon adoption should be of concern to both regulators and investors (Capkun, Cazavan-Jeny, Jeanjean, and Weiss 2011). In a 2007 report on the European Union implementation of IFRS, the Institute of Chartered Accountants in England and Wales (ICAEW) noted comparability was impeded among and between first-time adopters. The report also stated that these implementation differences will have an effect on future periods of financial reporting (ICAEW, 2007).

Table 1 presents the optional exemption choices by entity count extracted from the disclosures. The optional exemption choices which were most frequently exercised by sample firms were business combinations, share-based payments, and cumulative translation differences. On average, firms exercised 2.72 optional exemptions. The choices selected as well as the number of choices exercised bring into question the extent to which a firm adopts IFRS.

Table 1

OPTIONAL EXEMPTION CHOICES

Optional Exemptions	Firm Count
Business combinations	25
Share-based payment transactions	25
Fair value or revaluation as deemed cost	7
Deemed cost of oil and gas assets	2
Leases	1
Employee Benefits	5
Cumulative translation differences	19
Investment in subsidiaries, jointly controlled entities, and associates	1
Compound financial instruments	1
Designation of previously recognized financial instruments	1
Decommissioning liabilities	5
Service concession arrangements	1
Borrowing costs	10
Total Number of Optional Exemption Choices made by Sample Firms	103

DATA COLLECTION AND SAMPLE

IFRS was mandated effective January 1, 2011. However, early adoption was permitted subject to approval of the CSA. Quarterly financial statements, management discussion and analysis reports, and annual financial statements were obtained from company websites, SEDAR, EDGAR, and the TMX website. The audit opinion letter, accounting policy disclosure, and required IFRS 1 disclosure were reviewed for explicit language regarding early adoption. Reconciliation data for this study was hand-collected.

The sample consists of 39 Canadian PAEs deemed "pure" early adopters from a population of 69 PAEs which sought early adoption of IFRS. "Pure" early adopters are defined as those companies which met the following criteria:

- Audit opinion letter stated presentation, "in accordance with International Financial Reporting Standards."
- Financial statement note on "Basis of presentation" cited compliance and conversion to International Financial Reporting Standards as issued by International Accounting Standards Board as well as the entity's transition date.
- Financial statement note disclosure on adoption of International Financial Reporting Standards contained reconciliation from Canadian GAAP to IFRS of the statement of financial position at the transition date.

Although PAEs opting for early adoption were required to seek CSA permission, there were no additional reporting requirements for early adopter firms. The process and reporting requirements, for example adherence to IFRS 1, were the same for early adopter and compulsory complaint firms.

The firms presented in this study were regulated by five provincial regulators: Alberta, British Columbia, Ontario, Quebec, and Saskatchewan. Sample firms were overwhelmingly represented by the mining industry which is consistent with prior literature on Canadian early adopters (Blanchette, Racicot, and Girard 2011). The industry classifications represented in the sample were: Mining (n=28), Utilities (n=2), Manufacturing (n=5), Information (n=1), Real Estate, Rental, and Leasing (n=2), and Professional, Scientific, and Technical Services (n=1).

ANALYSES OF EQUITY COMPONENTS

The majority of research has examined IFRS by comparing national GAAPs to IFRS through various analyses primarily examining earnings through comparability indices (Fifield, et al. 2011; Haller, et al. 2009) and key financial ratios (Lantto and Sahlström 2009, Blanchette, et al. 2011). A growing body of literature has also tested the value relevance of accounting information delivered by the IFRS reporting system (Horton and Serafeim 2010; Christensen, Lee, and Walker 2009, Schadewitz and Vieru 2007; Gjerde, Knivsflå, and Sættem 2008). However, the true market valuation of the earnings and book value reconciliations are observable only in the year of transition when financial statements are prepared both under local GAAP and IFRS. These differences are reported in aggregate in the change in total stockholders' equity (Hung and Subramanyam 2007). Without a complete deconstruction of the how IFRS is being applied, evidence from the present study brings into question our ability to evaluate earnings as reported under the IFRS system or interpret results from tests of market reaction.

Decomposition of Equity Adjustments

Table 2 presents the decomposition of reported adjustments to equity by IFRS standard. The standard affecting the most firms in the sample (n=20) was IFRS 2 *Share-Based Payments*. This standard had a magnitude effect on the adjustment to contributed capital of $41 million and a corresponding effect of -$41 million to the adjustment to retained earnings. The primary difference between IFRS 2 and CA GAAP 3870 was the way in which these options are measured. CA GAAP required the entire award of options to be measured at the intrinsic value whereas IFRS subjects these options to separate value tranches measured at fair value using an option price model. However, the true effect of the standard-to-standard difference is altered by an optional exemption permitted by IFRS 1 which allows the first-time adopter to not apply IFRS 2 to equity instruments granted after November 7, 2002 that vested before transition to IFRS. If a company applies the exemption, a reclassification adjustment is recorded which transfers the amount out of contributed capital into retained earnings. As demonstrated by this example, these equity components are not only affected by pronouncement differences, but choices made at adoption and switching among equity components.

IAS 12 *Income Taxes*, IAS 16 *Property, Plant, and Equipment*, IAS 40 *Investment Property*, and IFRS 1 *Cumulative Translation Differences* represent the standards with the largest magnitude effect on the retained earnings adjustment at -$6,898 billion, $19,580 billion, $4,930 billion, and -$13,428 billion, respectively. The negative tax effect is consistent with evidence from a study by Fifield et al. conducted in 2011 which examined IFRS reconciliations in the context of the U.K., Italy, and Ireland. IFRS 1 *Cumulative Translation Differences* represents the standard with the largest magnitude effect on the adjustment to accumulate other comprehensive income at $13,426 billion.

Table 2

DECOMPOSITION OF REPORTED ADJUSTMENT TO EQUITY COMPONENTS BY STANDARDS

Standard affecting reported adjustment to contributed capital	Effect by Standard (in millions)	Count of firms affected by standard	Average adjustment by firms affected by standard (in millions)
IFRS 2 Share-based Payment	41.129	19	2.165
Total reported adjustment to contributed capital	41.129		
Standards affecting reported adjustment to retained earnings			
IFRS 2 Share-based Payment	-41.464	20	-2.073
IFRS 6 Exploration for and Evaluation of Mineral Assets	32.427	3	10.809
IAS 11 Construction Contracts	-150.809	2	-75.405
IAS 12 Income Taxes	-6,898.00	8	-862.25
IAS 16 Property, Plant, and Equipment	19,580.47	3	6,526.82
IAS 17 Leases	-263.282	1	-263.282
IAS 18 Revenue Recognition	-793.503	3	-264.501
IAS 19 Employee Benefits	-834.64	4	-208.66
IAS 21 Foreign Exchange Rates	-36.161	4	-9.04
IAS 23 Borrowing Costs	-14.729	1	-14.729
IAS 36 Impairment of Assets	-29.345	3	-9.782
IAS 37 Provisions, Contingent Assets and Liabilities	-307.746	5	-61.549
IAS 38 Intangible Assets	7.318	1	7.318
IAS 39 Financial Instruments	234.533	5	46.907
IAS 40 Investment Property	4,930.44	2	2,465.22
IAS 41 Agriculture	288.879	1	288.879
IFRS 1 Deemed Cost	507.884	3	169.295
IFRS 1 Decommissioning Liabilities	-0.003	1	-0.003
IFRS 1 Cumulative Translation Differences	-13,428.06	11	-1,220.73
IFRS 1 Business Combinations	32.194	8	4.024
Total reported adjustment to retained earnings	2,816.40		
Standards affecting reported adjustment to accumulated other comprehensive income			
IAS 12 Income Taxes	156.755	1	156.755
IAS 21 Foreign Exchange Rates	-13.618	1	-13.618
IAS 39 Financial Instruments	-29.816	5	-5.963
IFRS 1 Cumulative Translation Differences	13,426.33	11	1,220.58
IFRS 1 Business Combinations	-7.554	1	-7.554
Total reported adjustment to accumulated other comprehensive income	13,532.10		

The Effect of Equity Component Switching

Table 3 eliminates the effect of equity reclassifications and presents the decomposition of the adjustments to equity components without component switching. In comparing Tables 2 and 3, continuing with the example of IFRS 2 *Share-based Payments*, the number of firms affected by the standard decreased from 20 to 2. After eliminating the switching effect, the magnitude effect on the adjustment to contributed capital decreased from $41 million to -$2 million and the cumulative adjustment to retained earnings increased from -41.464 million to 2.074 million. Removing the equity component switching effect divulges the true standard-to-standard financial effect.

IAS 12 *Income Taxes*, IAS 16 *Property, Plant, and Equipment*, and IAS 40 *Investment Property* continued to represent the standards demonstrating the largest magnitude effect on the retained earnings adjustment at -$6,741 billion, $19,580 billion, and $4,930 billion, respectively. Analysis of the adjustment to accumulate other comprehensive income after eliminating the switching effect revealed a decrease in the magnitude adjustment from $13,532 billion to -$7 million. This observation should put regulators, standard setters, practitioners, and researchers on notice that the way in which we analyze and measure equity components could be consequential to our ability to evaluate a GAAP change.

Table 3
DECOMPOSITION OF ADJUSTMENT TO EQUITY COMPONENTS BY STANDARDS WITHOUT SWITCHING

	Sum of Effect by Standard (in millions)	Count of firms affected by standard	Average adjustment by firms affected by standard (in millions)
Standard affecting reported adjustment to contributed capital			
IFRS 2 Share-based Payment	-2.409	2	-1.205
Total reported adjustment to contributed capital	-2.409		
Standards affecting reported adjustment to retained earnings			
IFRS 2 Share-based Payment	2.074	2	1.037
IFRS 6 Exploration for and Evaluation of Mineral Assets	32.427	3	10.809
IAS 11 Construction Contracts	-150.809	2	-75.405
IAS 12 Income Taxes	-6,741.25	8	-842.656
IAS 16 Property, Plant, and Equipment	19,580.47	3	6,526.82
IAS 17 Leases	-263.282	1	-263.282
IAS 18 Revenue Recognition	-793.503	3	-264.501
IAS 19 Employee Benefits	-834.64	4	-208.66
IAS 21 Foreign Exchange Rates	-49.779	4	-12.445
IAS 23 Borrowing Costs	-14.729	1	-14.729
IAS 36 Impairment of Assets	-29.345	3	-9.782
IAS 37 Provisions, Contingent Assets and Liabilities	-307.746	5	-61.549
IAS 38 Intangible Assets	7.318	1	7.318
IAS 39 Financial Instruments	210.206	3	70.069
IAS 40 Investment Property	4,930.44	2	2,465.22
IAS 41 Agriculture	288.879	1	288.879
IFRS 1 Deemed Cost	507.884	3	169.295
IFRS 1 Decommissioning Liabilities	-0.003	1	-0.003
IFRS 1 Cumulative Translation Differences	0	0	0
IFRS 1 Business Combinations	24.64	8	3.08
Total reported adjustment to retained earnings	16,399.25		
Standards affecting reported adjustment to accumulated other comprehensive income			
IAS 12 Income Taxes	0	0	0
IAS 21 Foreign Exchange Rates	0	0	0
IAS 39 Financial Instruments	-5.489	4	-1.372
IFRS 1 Cumulative Translation Differences	-1.73	1	-1.73
IFRS 1 Business Combinations	0	0	0
Total reported adjustment to accumulated other comprehensive income	-7.219		

Summarizing the Switching Effect

Table 4 summarizes the switching effect. The largest switching effect was within the adjustment to retained earnings at $13,582 billion. Of this amount, $13,428 billion (Table 2) related to cumulative translation differences, an optional exemption choice exercised under IFRS 1. This exemption permits firms to zero out balances of cumulative translation differences for all foreign operations at the transition date. Under Canadian GAAP, these differences were recorded in accumulated other comprehensive income as unrealized gains and losses. Upon transitioning to IFRS, the majority of the firms (n=16), in sample, elected to reclassify aggregated unrealized gains and losses to retained earnings, an earned capital account. More specifically, for the firms represented in the population of early adopters, $13,428 billion (Table 2) of unrealized translation differences bypassed the income statement and were reclassified to retained earnings.

Table 4
VARIATIONS OF ADJUSTMENT TO EQUITY COMPONENTS AND SWITCHING EFFECT

	As Reported (in millions)	Without Component Switching (in millions)	Switching Effect (in millions)
Adjustment to contributed capital	41.129	-2.409	-43.538
Adjustment to retained earnings	2,816.40	16,399.25	13,582.86
Adjustment to accumulated other comprehensive income	13,532.10	-7.219	-13,539.32
Change in equity	16,389.62	16,389.62	0

Summary of Standard Effects on all Components of Equity as Reported

Table 5 presents a summary of the magnitude adjustments to the components of equity as reported disaggregated by the IFRS standard effect. Table 5 combines the financial magnitude adjustments by standard from Table 2 and reconciles these adjustments to the financial magnitude on total stockholders' equity. IAS 16 *Property, Plant, and Equipment* demonstrated the largest percentage of change in total stockholders' equity at 119 percent of the overall change in stockholders' equity. IAS 16 permits the revaluation of property, plant, and equipment to fair value which explains the positive adjustment of re-measurement of $19,580 billion to total stockholders' equity.

As discussed in section titled, summarizing the Switching Effect, the IFRS 1 election for cumulative translation differences increases accumulated other comprehensive income by $13,426 billion and decreases retained earnings by $13,428 billion. However, upon examination of the effect of this standard on the adjustment to total stockholders' equity, the remeasurement effect is relatively minimal at a decrease of $1.7 million resulting in an overall decrease to total stockholders' equity of .01056 percent. More specifically, the real effect of transition is obscured at the stockholder's equity level of analysis.

CONCLUSION

The preceding deconstruction of the implementation of IFRS exhibits the complexity of adopting IFRS. The decomposition of equity components provides an opportunity to observe adoption effects concealed at aggregated stockholders' equity. Magnitude adjustments disaggregated by pronouncement differences permits a more comprehensive understanding of the particular standards which are associated with the adjustments to equity components. Further, only when equity components are decomposed can reclassifications (component switching) among the components be observed. Component switching reveals the implementation effects of IFRS on equity. As demonstrated in the study, underlying the switching effect (implementation choices) are the true GAAP-to-GAAP differences which can only be observed upon disaggregation.

An examination of the exercised optional exemptions brings into question the extent to which IFRS is adopted. The extent to which IFRS is adopted is crucial to the larger assessment of whether the IFRS reporting system reduces information asymmetry and increases accounting quality. Consideration of the modifications and limitations of the implementation of IFRS has great bearing on our ability to measure any improvement IFRS may contribute to financial reporting.

By examining the IFRS transition in a comparable country context to the United States, this study provides preliminary evidence which compels attention from standard setters and regulators as to how IFRS is being applied. If the magnitude of the IFRS transition is primarily comprised of management choices and equity component switching as the evidence from this study suggests, standard setters and regulators may want to investigate this trend further as they weigh the costs of adopting IFRS versus the benefits the IFRS reporting system. At a minimum, findings from this study should prompt standard setters, regulators, practitioners, investors, and researchers to carefully consider how IFRS is being applied and the extent to which it is being adopted when assessing the standards for any attainment of relevance, quality, and comparability.

Table 5
SUMMARY OF STANDARD EFFECT ON ADJUSTMENTS TO EQUITY COMPONENTS

	Adjustment to Equity Components as Reported (in millions)				
	Contributed capital	Retained earnings	Accumulated other comprehensive income	Total Stockholders' Equity	Percentage of Change in Equity by Standard
IFRS 2 Share-based Payment	41.129	-41.464	-	-0.336	0.00%
IFRS 6 Exploration for and Evaluation of Mineral Assets	-	32.427	-	32.427	0.20%
IAS 11 Construction Contracts	-	-150.809	-	-150.809	-0.92%
IAS 12 Income Taxes	-	-6,898.00	156.755	-6,741.25	-41.13%
IAS 16 Property, Plant, and Equipment	-	19,580.47	-	19,580.47	119.47%
IAS 17 Leases	-	-263.282		-263.282	-1.61%
IAS 18 Revenue Recognition		-793.503		-793.503	-4.84%
IAS 19 Employee Benefits	-	-834.64	-	-834.64	-5.09%
IAS 21 Foreign Exchange Rates	-	-36.161	-13.618	-49.779	-0.30%
IAS 23 Borrowing Costs	-	-14.729		-14.729	-0.09%
IAS 36 Impairment of Assets	-	-29.345	-	-29.345	-0.18%
IAS 37 Provisions, Contingent Assets and Liabilities	-	-307.746	-	-307.746	-1.88%
IAS 38 Intangible Assets	-	7.318	-	7.318	0.04%
IAS 39 Financial Instruments	-	234.533	-29.816	204.716	1.25%
IAS 40 Investment Property	-	4,930.44	-	4,930.44	30.08%
IAS 41 Agriculture	-	288.879	-	288.879	1.76%
IFRS 1 Deemed Cost	-	507.884	-	507.884	3.10%
IFRS 1 Decommissioning Liabilities	-	-0.003	-	-0.003	0.00%
IFRS 1 Cumulative Translation Differences	-	-13,428.06	13,426.33	-1.73	-0.01%
IFRS 1 Business Combinations	-	32.194	-7.554	24.64	0.15%
Total Adjustments to Equity Components	41.129	2,816.40	13,532.10	16,389.62	100.00%

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THE PROBLEM OF LIMITED SCOPE AUDITS

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ABSTRACT

In May 2015, the Department of Labor (DOL) released a report of its findings from statistically sampling 400 audits reports. With an alarming 39 percent of the audited reports containing one or more significant violations of Generally Accepted Auditing Standards (GAAS) there is cause for concern and need for change.

The study, the fourth such one undertaken since enactment of the Employee Retirement Income Securities Act of 1974 (ERISA), was conducted as part of the DOL's periodic monitoring of the quality of the audit reports. These audit reports were chosen from reports prepared by the more than 7,000 Certified Public Accountant (CPA) firms that audit the 81,162 filings of Form 5500 Annual Return/Reporting (Form 5500) for pension funds. The violations of these auditing standards could lead to rejection of Form 5500 for the fund, and as written in the DOL report such mistakes risked the assets of 22.5 million plan participants and beneficiaries for the $653 billion of assets in those funds.

While briefly addressing other aspects of the DOL report, and providing a historical view of the studies to put the problem into prospective, this paper focuses on a feature unique to pension plan audits and only to pension audit plans, the limited scope audit. Since 1978, the American Institute of Accountants and others have periodically called for elimination of the limited scope audit. In 2011, the year of the study, 80 percent of all pension fund audits were conducted under the scope limitation audit. The paper provides support to the argument that the controversial limited scope option should be eliminated because it is associated with a significantly greater likelihood of information not fairly-stated.

INTRODUCTION

In May 2015, the Department of Labor (DOL) released a report of its findings from statistically sampling 400 audits reports. With an alarming 39 percent of the audited reports containing one or more significant violations of Generally Accepted Auditing Standards (GAAS) there is cause for concern and need for change.

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While briefly addressing other aspects of the DOL report, and providing a historical view of the studies to put the problem into prospective, this paper focuses on a feature unique to pension plan audits and only to pension audit plans, the limited scope audit. In 2011, the year of the study, 80 percent of all pension fund audits were conducted under scope limitation. Use of the limited scope option is permitted for pension fund report by choice of the fund administrator.

The DOL's comprehensive report contains eleven recommendations collected into three groupings labeled: enforcement, regulatory/legislative, and outreach. Four enforcement recommendations target existing problem areas of collecting increased fines and imposing sanctions on those CPAs performing nonstandard work that leads to audit deficiencies. Four recommendations labeled as outreach to state boards of accountancy and plan administrators target limiting or precluding some CPAs from performing pension fund audits. Primarily these recommendations if endorsed might preclude new CPAs or small practice CPA firms from conduction pension fund audits. Finally, the three regulatory/legislative recommendations contain two which support giving accounting/auditing rule making power to the Secretary of Labor and one recommendation to repeal the limited scope audit. This paper focuses on the last recommendation repeal of the limited scope audit.

BRIEF HISTORY AND THE PROBLEM OF LIMITED SCOPE AUDITS

In 1974, Congress passed the Employee Retirement Income Security Act (ERISA). ERISA was unique compared to earlier pension regulation/law. ERISA was passed to protect the information integrity and to safeguard interests of participants and others expected beneficiaries of covered pension plans. From the beginning, this law, ERISA required filing of an annual report within 210 days after the end of the plan year and this report, Form 5500, must be audited. While prior laws existed for pension plans, no audit was required until ERISA was passed. Furthermore, Section 103 of ERISA required that both accounting practices and audit work must meet professional accounting and auditing standards.

The passage of ERISA marked the beginning of a requirement for an unbiased opinion on the fairness of the information contained in the pension report submitted to the DOL. This law also included the fund administrator's choice for a limited scope audit which was and is very unique to audit standards and practices. By limiting the scope, the auditor is not required (allowed) to test certain information that would normally be tested (Wood, 1995). The idea behind limiting scope would be the elimination of a duplication of effort because funds held with certain financial institutions should be reviewed by the institution's regulators. Plans with more than 100 eligible participants categorized as a funded, qualified retirement plan or other ERISA benefit plan are required to file the Form 5500 Annual Return/Report and thus to be audited by an independent qualified public accountant.

By auditing standards, the auditor must gather, study, inspect, test, etc. sufficient evidence upon which to issue an opinion on the engagement. This action is referred to as the scope of the audit engagement. By ERISA law, the fund administrator chooses whether to engage an auditor for a full audit or limited scope audit. The auditor may accept or decline the engagement. However, in the usual audit situation, after acceptance of the engagement, when management or the plan administrator limits access to information the auditor either gives a qualified opinion or disclaims an opinion on what cannot be examined. The auditor's guidelines for which opinion to offer depends up the materiality of what is not examined compared to the entity as a whole. For a pension fund, a scope limitation on the funds within the pension plans would surely be a material item and lead to disclaiming an opinion in any circumstance other the limited scope audit created by ERISA law.

Periodically, The Employee Benefits Security Administration (EBSA) formed in 1988 conducted studies for the DOL. The studies the agency conducted as statistical study addressed the quality of audit work done by CPAs for pension plans. Table 1 shows the results of all four studies of the quality of audit reports.

Table 1 ASSESSING THE QUALITY OF AUDIT REPORTS (Source: Department of Labor Study)				
Year of Audit Quality Study	1988	1997	2004	2014
Audits with GAAS Deficiencies	23%	19%	33%	39%

For the study conducted with 2011 date, EBSA used statistical sampling divided into six strata with 400 samples from 81,162 Form 5500 filings. Strata were divided by number of reports completed by auditor/firms with more samples selected from the strata of those conducting few audits. Table 2 shows the strata and the percentage of deficiencies.

Table 2 MAJOR DEFICIENCY AUDIT RATES BY STRATA (Source: Department of Labor Study)		
Strata	**Audit Reviews**	**Audits With Deficiencies**
1-2	95	75.8%
3-5	95	68.4%
6-24	95	67.4%
25-99	65	41.5%
100-749	25	12.0%
750 +	25	12.0%
Total Reviewed	400	38.8%

This sampling plan was used by EBSA because prior studies showed that less experienced auditors were more likely to make mistakes than more experienced auditors. Of the audit reports selected throughout the sample 80% were reports from limited scope audits.

As stated earlier in this report, the results indicated that 38.8 percent of the reports sampled contain at least one deficiency, such as a major misuse, misapplication, error or disregard, in required observance of generally accepted auditing standards. These results reflects a major problem with auditor work in apply GAAS to Form 5500 reports that needs reforming. As might be expected, 93% of problem audits were in the four strata for auditors completing less than 100 pension audits per year. However, the DOL results noted that 82% of the work with deficiencies came from the two strata of 6-24 plans and 25-99 plans audited.

ERISA law requirements are complicated. By association, the auditing requirements unique to pensions plan audits are complicated. Not surprisingly, experience or lack of experience in pension audits must be an important factor to be addressed. Still, with 80% of all pension plan being conducted by the legislated, nonstandard limited scope format, this unique to auditing faction needs to be addressed.

Some (Nogler & Armstrong, 2013; Lilling, 2015) suggest that CPAs often overstretch. When a client, for whom the CPA performed other services, asks the CPA to perform a pension audit with limited scope, the CPA may misunderstand or make assumptions that lead to less audit work than the auditing and ERISA standards require. Perhaps, the CPAs incorrectly assume that the disclaimer for limited scope makes this engagement not an audit (Hein, 2014).

Unfortunately, the DOL report uses data studied from 2011 and only issued in 2015. Sufficient time has passed for even more problems to continue while recommendations await action in many cases. One of the related issues is the increasing trend of use of limited scope audits. Within the Department of Labor Report is the trend for increasing use of limited scope

audit by pension plan administrators. The upward trend for limited scope audits for pension plans reached 80% in the year of study and 83% in 2013, the last year report. Table 3 repeats these statistics from the report.

Table 3
LIMITED SCOPE AUDIT TREND
(Source: Department of Labor)

2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
48%	51%	56%	59%	62%	62%	65%	67%	78%	79%	80%	81%	83%

As stated previously, the fund administrator chooses whether or not to limit scope for these audits. MacKay (401(k) Advisor, Part I, 2008) states that the plan administrator may elect the limited scope audit. To qualify for this election, the trustee or custodian of the plan must provide a certification which states that the plan financial information is complete and accurate. A bank or other qualifying organization must provide this certification. Additional work is required of the auditor even under limited scope conditions which include planning and review of necessary controls on the plan, and supplemental information. MacKay (401(k) Advisor, Part II, 2008) continues by stating that new accounting changes require the auditor to evaluate risk assessment as to whether fraud or unintentional errors may be present even in the limited scope audit situation.

ARGUMENTS FOR ELIMINATION OF LIMITED SCOPE AUDITS

None of the results sited from any of the four of the prior studies conducted by the EBSA for the DOL are impressive. At best over the decades, one in five reports may contain at least one deficiency in GAAS that could lead to rejection of the Form 5500. At worst, the results from the most recent report show double that rejection rate. With higher deficiencies being found in reports and with greater use of the limited scope audit, logic would suggest that there would be a tie between problems of audit reports and the use of limited scope. The use of limited scope audits may not be in the best interest of plan participants not in the best interest of auditors. Limited scope audit is a legal exception to normal accounting and auditing practices for a very complicated report. The DOL study only sampled 400 reports from 81,162. How many reports slipped through the review process with deficiencies that led to losses for the 22.5 million plan participants and beneficiaries?

Over the years since enactment of ERISA, the Limited Scope Audit continues to be a controversial option. The American Institute and many others (Henry, 2014; Hughes, 2013; Lilling, 2015; Tysiac, 2015; Walker, 1996; Wood, 1995) state the problems, misunderstandings, and misinterpretations of the limit scope audit. Inexperienced auditors may lack skill to catch these problems, misunderstandings and misinterpretations and experienced auditors may do so too. Some plan administrators lack the skills to understand potential problems with the use of limited scope. And plan administrator may misuse this legal loop hole to commit fraud. When the financial institution hold the plan's investments makes a mistake in certification or does not meet certain qualifications, the auditor must catch the problem even though scope is limited (Journal of Accountancy, 2014) and experienced auditors may not do so.

The limited scope audit was included in ERISA by what might be surmised as an attempt to make the additional requirement of an audit more acceptable and cost benefit arguments continue. The employing organization that offers a qualifying pension plan must file Form 5500 and Form 5500 requires an annual audit. For smaller employers, the cost of a full audit may

exceed the benefit of assurance of correct information (Langbert, 2001). Yet, what are the costs of errors to pension fund participants, DOL and related regulators and CPAs from the continued use of a much misunderstood or less than effective limited scope audit?

As early as 1978 the AICPA publicly pushed for full-scope audits (Journal of Accountancy, September 1992). Among the concerns expressed then and now is that fraud, misunderstanding or weaknesses in plans (CPA Journal, 1993; Czarnecki, 1996) and serious ERISA violations may not be caught with limited scope audits.

Two prior attempts to repeal the Limited-scope audit failed. The Labor Law Journal (1990) notes in its miscellany column that Secretary Elizabeth Dole recommended legislative changes to ERISA including the repeals of the limited scope audit exception and to use a single audit approach. Senator Robert Dole and House Minority Leader Robert H. Michel introduced a bill in 1990 seeking repeal of the limited scope audit. The bill failed. Again in 1996, a bill to end limited scope audit failed even though it was strongly supported by the American Institute of Certified Public Accountants (Journal of Accountancy, 1996). These bills coincided with the first two DOL studies conducted by the EBSA.

Recommendations to repeal the limited score opinion continue (Halonen, 2010; Hughes, 2013; Walker, 1996; Wood, 1995). In 2011 the ERISA Council continued to support the limited scope audit in the face of continued concerns about problems (Wilson, 2011). The reason for the continuation - cost/benefit. The council's reason for its continued support was that benefits from elimination of the limited scope audit would not exceed the costs. In an about face, the next year, Etheridge (2011) writes that the DOL is seriously considering revoking the limited scope audit. Yet, the limited scope option still remains and is still listed as an item of consideration for the DOL study.

CONCLUSIONS, RECOMMENDATIONS AND FUTURE RESEARCH

Plan administrator selection of limited scope audits continues to increase at an increasing rate as stated in the DOL study. Some plan administrators chose this option to reduce costs of the audit and by law the auditor must comply with this request or decline the engagement. Yet, the statistical results from the DOL's most recent study show that this option, limited scope audit may not be in the best interest of anyone, given the complicated ERISA law and related complicated auditing standards.

Numerous authors, the AICPA and even the DOL in its most recently released study make an argument for finally eliminating the limited scope audit as an option for pension fund reports. As the DOL study documented hundreds of billions of dollars are at risk for millions of people who count on fairly-stated information in their pension funds. The limited scope audit should be eliminated because it is associated with a significantly greater chance for information that is not fairly-stated.

Cost issues are and have always been part of the argument on pension fund audits. However, the argument might be made not for cost vs. benefit but rather who, how, or when the cost will be absorbed. While the DOL sided with the idea of reducing costs by allowing the limited scope audit, its own study points to significant problems with the option. Ultimately, pension plan participants and recipients will bear the cost of deficient reports from auditor or plan administrator actions should fraud or reporting deficiencies lead to losses. In the face of continuing problems those auditors who audit funds with limited scope will likely need to increase audit fees to cover the potential problems that may come with the continued use of this

unique option, the limited scope. This too is a potential cost the pension plan participants and recipients will bear albeit indirectly.

As with the three prior studies, this highly confidential information is accessible to the DOL, and related government agencies. When submitted by the CPA through the peer review process, at least some of these reports should be reviewed by other CPAs. While not the focus of this paper, an additional concern of the DOL report is that the supposed checks and balances of peer review process for CPA work have not been effective. The AICPA has been working with the DOL to provide improved monitoring of auditor work through the peer review process and also adding learning opportunities for CPAs who accept pension fund audits.

Nevertheless, the DOL study and related report list eleven recommendations that contain many opportunities for future study. The issue of deficiencies in audit reports and the related study point to many issues needing future research. This paper only addressed one of the eleven recommendations contained in the study. The cost/benefit issues, the potential legislation, the peer review process which this paper does not address are some areas deserving further study.

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STUDY OF THE FORECASTING PERFORMANCE OF CHINA STOCKS' PRICES USING BUSINESS INTELLIGENCE (BI): COMPARISON BETWEEN NORMALIZED AND DENORMALIZED DATA

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ABSTRACT

It is widely acknowledged that the impacts of various kinds of information on stock prices are extremely difficult, if not impossible, to measure in terms of duration and significance. During 2002 and 2012, the high fluctuations in China's stock markets made price prediction challenging to perform. Historical events that occurred both domestically and internationally, such as the dot-com bubble, the outbreak of SARS, party leadership transitions, the global financial crisis and resulting economic recession, the Wenchuan earthquake, and the Beijing Olympic Games further served to prove this point. The objectives of this study are to therefore explore critical indicators in stock price forecasting in order to increase accuracy for professionals in the market. This will be done by comparing the forecasting performances of the Normalized Data (ND) versus the Denormalized Data (DD) to measure how accurate our Neural Network (NN) models are. The results demonstrate that using ND and DD produce identical results, which means we do not need to spend time on repeating the data denormalization process in future researches.

Keywords: *Business Intelligence, Financial Forecasting, Investment Strategies, Behavioral Finance, Momentum and Reversal, Overreaction and Underreaction, Technical Analysis, Data Mining, Data Normalization, Denormalization, Forecasting Techniques, Neural Networks, and Artificial Intelligence*

INTRODUCTION

Business Intelligence (BI) represents a powerful technique for extracting meaningful information from vast amounts of raw data, interpreting inherited relationships among the data, and eventually facilitating the decision making process.

Stock markets, located throughout the world, generate numerous data covering various aspects on a daily basis. Investors who expect to make profits by forecasting stock market prices are confused by easily accessed but overwhelming information. A wide array of factors, such as the fluctuations in major global stock indices, competitors, investors' sentiments, and political elections make the prediction of stock prices even more complicated.

The stock market in China, one of the largest markets in the world, has its own unique characteristics. It has been more than 30 years since economic reform was launched in China but it is still considered young and state-controlled with a high degree of corruption. A study of the distinct differences between the stock markets in China and the markets in developed countries would yield compelling results.

The authors have been conducting research in predicting stock prices utilizing Business Intelligence (BI) for several years. Kwon, Tjung, and Tseng (2012) indicated that the Neural Network (NN) model, using a financial data mining technique, performs better in forecasting stock prices than the Ordinary Least Squares (OLS) model does in US stock markets. The forecasting accuracy is measured in terms of the significant percentage forecasting error of the mean and standard error. For the NN model, means vary from 2.1% to 12.31% and standard deviations change from 2.11% to 14.92%. The OLS model has means from 1.93% to 24.8% and standard deviations from 2.15% to 12.3%. In addition, the NN model provides more insights in identifying critical predictors which would increase forecasting accuracy in stock market analysis. The study considers eight indicators which are macroeconomic indicators, microeconomic indicators, market indicators, market sentiments, institutional investors, political indicators, business cycles, and calendar anomalies. Furthermore, as a linear model, OLS has limited capacity and inconsistent performance in stock market prediction.

In this study, the NN model is applied to predict the price fluctuations in China's stock markets. The sample period ranges from 2002 to 2012 covering the dot-com bubble in late 2002, 2003's outbreak of SARS, party leadership transitions in 2002 and 2012, the global financial crisis and economic recession since 2007, and lastly the Wenchuan earthquake and the Beijing Olympic Games of 2008. In addition, 25 indicators, including macroeconomic indicators, market sentiment indicators, institutional investors, and microeconomic indicators, were added as independent variables to better predict the stock price changes in China. National holidays were also taken into consideration in the forecasting model. In our previous study, we received criticism that the results would lose physical meaning as stock prices after multiple steps of data manipulation. Thus, in this study, we de-normalized the predicted results and compared them with the original stock prices. The new generated dataset will be more compelling in explaining the forecasting accuracy of the BI approach.

LITERATURE REVIEW

Business Intelligence in Stock Price Forecasting

Business intelligence has been widely researched in stock market prediction in recent years. The NN model will be the primary form of business intelligence techniques in this study. In recent years, several studies have been conducted to compare the different versions of NN models regarding the productivity of China's stock markets. Dai, Wu & Lu (2012) proved that the combination of nonlinear independent component analysis (NLICA) and neural network has higher accuracy in forecasting Shanghai B shares than other NN models, including LICA-BPN, PCA BPN, and single BPN. Liu and Wang (2011) demonstrated that the combination of independent component analysis (ICA) of fluctuations' statistical behaviors in the Chinese stock markets and NN model (ICA-BP) outperforms both the common BP model with principal component analysis (PCA-BP) and the single BP model in forecasting the fluctuations of China's stock markets. Cao, Han, and Lam (2013) found that the back propagation network is slightly better than the radial basis function network in terms of measuring the productivity of the Chinese stock price trends. The NN model can also be applied in other areas related to Chinese stock markets. Meng (2008) successfully applied the NN models in forecasting IPO return in the Chinese stock markets. Wang, Pan, and Liu (2012) applied a jump time effective neural network to forecast the fluctuations in the Chinese stock markets and Chinese crude oil price index.

There are previous researches that compare the NN models with other traditional finance models in forecasting. For instance, Cao, Parry, and Leggio (2011) compared the artificial NN models with a dynamic single-factor CAPM-based model. Fama's (1970) three-factor model in forecasting the Chinese stock markets concluded that the artificial NN models outperformed the other two linear models.

Additionally, previous research compared performances of the NN models in different countries. Liu and Wang (2012) found that a combined time strength function will increase the accuracy of the Legendre neural network in stock market movement prediction based on the data from Shanghai A share and B share, the Industrial Average Index, and the Nasdaq Composite Index. The study also suggests that the Chinese stock markets experience sharper fluctuations.

Government Regulations

China's government plays an important role in its economic and financial sectors. Chan, Fung, and Thapa (2007) indicated that imperfection and incompleteness are the apparent characters of an emerging financial market and that government regulations on transparency and fairness are critical factors in such a market. The economic, institutional, and market microstructures in China are different from those in the U.S., which is probably caused by the Chinese government regulations. Segmentation in the financial market, which would potentially lead to mispricing, can also be created by government policies. Sun, Tong, and Tong (2002) proposed that the optimum level of government control can improve privatized firms' performances, particularly in the fields of profitability, sales, and employees' productivity. However, over-control has a negative effect on the firms' performances, while under-control show the lack of political support from the government.

In 2002, 80% of the public companies listed in China's stock markets were owned by the government (SSNSIC, 2003). A series of studies conducted by Xu and Wang (1999), Varela and Wei (2002), and Sun and Tong (2003) proposed that the participation of non-financial institutional investors tended to improve the companies' performances whereas the state-owned enterprises (SOEs) were inefficient since they lacked governance. Vickers and Yarrow (1988) argued that "monopoly of information", caused by the dominant public sector, made it hard to evaluate the SOEs' performances. Putterman (1993) proposed that since government officials are not under the surveillance of the public in a socialist market economy, they are not fully functional in monitoring the dominant public sectors. Shleifer and Vishny (1994) argued that politicians and enterprise managers/shareholders in control of the SOEs preferred to maximize their private utilities rather than maximize social welfares. Zhang (2004) indicated that the effectiveness of monitoring of the SOEs is diminished when the public sector is dominant in the market. The study explained reasons for the relative ineffectiveness of Chinese corporatization where weak surveillance and inefficiency were caused by the unwillingness of the state to give up the control of the SOEs. In addition, enterprise managers did not take control of the companies through corporatization so the implementation of revenue-generating activities was restricted.

Yao and Yueh (2009) found that China's stock market was one of the largest when it came to market capitalization in Asia in 2004. The fluctuation in market returns was high, because the price of each type of share, such as individual, government, A, B, and H, was prescribed and different types of share had unique trading regulations. Riedel, Jin and Gao (2007) indicated that the share values were designated, instead of determined, by the market since the percentage of non-tradable shares of 1,400 public companies in China's stock exchange were found to be as high as 69%.

Gordon and Li (2003) argued that China's government generated revenue from both foreign and domestic investors by choosing unusual regulations in the financial markets and that these regulations lead to a maximized, standard type of social welfare function. The study also indicated that because of the pressure imposed by the government the Chinese banking system has to lend money to state-owned enterprises regardless of the firms' financial performances.

Corruption

According to He (2000), the situation of corruption in China is even worse during the economic reformation period. Because of the high degree of corruption, market competition and economic conditions are manipulated. Corrupt authority allocates resources according to bribes instead of market efficiency. In order to make unjust profits, many businesspersons bribe the officials to avoid government regulations.

Watanabe (2002) indicated that there is an increasing likelihood of a significant amount of money being expropriated from minority stockholders to major shareholders under the weak legal protection in China. Knight and Yueh (2008) argued that entrepreneurs in China may take advantage of interpersonal relationships, a long-held tradition in Chinese culture and history, to exploit the imperfect legal system.

Tondkar, Peng, and Hodgon (2003) argued that the Chinese Securities Regulatory Commission (CSRC) is far less advanced than the U.S. Securities and Exchange Commission (SEC) in terms of regulation, information transparency and investor protection. The study also indicates that the Chinese government makes the decision about which companies may be listed on the stock markets according to a governmental quota-based system. The purpose of this unique domestic listing requirement, established by the CSRC, is to allow only a few companies with sound financial performances to be approved. Under the circumstances, the government prefers State-Owned Enterprises (SOEs) rather than private companies even though the private sector usually creates more profits. To make matters worse, uninformed investors may be misled by the government's favor of SOEs and make irrational investment decisions. Individual investors are only able to obtain partial financial information of the public companies since the CSRC does not require transparent financial reporting. This also significantly affects investors' judgment. Firth, Rui, and Wu (2009) argued that the CSRC takes on a bureaucratic style of regulation and disseminates Sanction and Enforcement Information (SEI) to the public with more than 15 days of delay. On the other hand, timely disclosing of the SEI to keep the public completely informed is extremely important in countries with matured stock markets. Therefore, investors in China are less confident because they only have access to substandard information which is a result of lagged disclosure of the SEI.

Fan, Wong, and Zhang (2007) found that it was a trend to have politically connected CEOs, who were current or former government officials and lacked relevant professional experience in public companies in China. The stock returns of such firms were lower than those of politically unconnected competitors.

Predictability

Previous researches show that the predictability of China's stock markets is weaker than that of the U.S. markets. Chin and Wang (2004) found evidence supporting the return predictability in China's stock markets. Chen, et al. (2010) reported that the predictability for China's stock markets is relatively weak compared to the U.S. markets, which may be caused by less heterogeneously distributed return predictors and less informative stock prices in China. Su (1998)

studied matured stock markets in developed countries and finds that China's stock markets had a low risk adjusted return but very high volatility of returns. According to Zhang, Wei and Huang (2014), individual stocks in China's markets were more difficult to predict than those of the U.S. markets, mainly depending on the comparison of stocks between the S&P 500 and the Shanghai composite index. Li and Zhang (2013) pointed out that there is a strong return relationship existing between China and the U.S. stock markets with cojump effects and short- term spillover effects. The study of Lee and Rui (2000) showed that the Chinese stock market returns cannot be predicted by trading volume while partially affected by the U.S. returns. The study also suggests that Chinese stock returns do not follow a random walk.

In China's stock markets, industry concentration and market capitalization can explain the predictability of returns in different industries and sectors. Stock portfolios in finance, insurance, services, and real estate industries have the highest predictability and the lowest ownership concentration while stock portfolios of small capitalization firms were partly predictable (Jiang, 2011).

Efficiency

The literature suggests mixed results on stock market efficiency in China. In early studies around 2000, Ma and Barnes (2001) argued that China's stock market was not a weak-form efficient. Li (2003) pointed out that China's stock market is still developing with a trend to be efficient. Groenewold, Tang, and Wu (2003) found that market efficiency was averse to the banks' exclusion. Recently, Kang, Cheong, and Yoon (2010) found that the Chinese stock market goes against the market efficiency theory whereas Lim, et al. (2013) indicated that the Chinese stock market is weak efficient.

Investors' Behavior

Investors' behavior is another vital factor in China's stock markets and previous research has discovered several special investors' behaviors related to various areas in Chinese stock markets. For instance, both too high and too low Corporate Social Responsibility (CSR) performances may result in investors' undesirable reactions (Wang, Qiu & Kong, 2011). Wu (2013) found that price under-reaction related to trading information existed in Chinese stock markets because the public was unable to completely capture the trading information in order flows and information availability delayed different investors groups from the lead-lag effect. According to Lu (2004), Chinese investors showed a strong disposition effect in stock markets and were more willing to keep stocks under deep loss or gain.

In addition, there is a higher threshold that tends to govern momentum behaviors in the Shanghai stock market than in mature markets, like the ones of Japan, Hong Kong, and the US (Wei, Huang, and Hui, 2013). The authors also point out that higher opportunities for using momentum strategies in the Shanghai market were consistent with the inefficiency in the emerging market.

Furthermore, an argument came up amongst previous studies about herding behavior in China's stock markets. Demirer and Kutan (2006) found that there was no obvious herd formation in Shanghai and Shenzhen stock markets whereas Chiang, Li and Tan (2010) found the contrary - the herding effect existed in both Shanghai and Shenzhen A- share markets but not in the B - share markets. Yao, Ma, and He (2014) proposed that investors' herding behavior exists and is prevalent in the B-share markets, especially in the stocks of the largest and the smallest companies.

Investor sentiment is another investors' behavior that has been widely researched in China's stock markets. Li (2014) conducted a sentiment index with good productivity on China's stock markets. Chi, Zhuang, and Song (2012) indicated that investor sentiment has relatively strong effects on stock market returns.

The research of Sanddorf-Kohle and Friedmann (2002) showed that "bad news" had more of an impact on the A-share indices than "good news" yet Lee and Yeh (2000) found that "good news" had larger impact on expected volatility on China's stock markets than "bad news".

Conclusion of Literature Review

China's stock markets are still developing with imperfect regulations and high levels of government intervention. The predictability also varied in previous researches and studies. There are several research papers that used the neural network models to forecast China's stock markets. Some have normalized their data for analysis, including Liu and Wang (2012), Liu and Wang (2011), and Wang, Pan and Liu (2012). Yet another research paper used Alyuda NeuroIntelligence to forecast stock price fluctuations in the U.S. stock markets with data normalization (Tjung, Kwon and Tseng, 2012). However, none of them have tested the forecasting estimation back to real price changes (denormalized). Previous papers focusing on China's stock markets used a limited number of companies and only the major indices from China's markets. For the U.S. stock markets, however, Tjung, Kwon and Tseng (2012) forecast the price fluctuations of 37 stocks with a larger data input, including 267 companies' stocks. Hence, we are going to compare the performance between Normalized and Denormalized data on neural networks with large companies and indices data.

HYPOTHESES

In our previous paper (Kwon, Tjung, and Tseng, 2013), normalized data was utilized to predict stock performance. First, we calculated the daily changes of the stock prices ($C_i = P_i - P_{i-1}$), shifted all data to positive numbers by adding maximum change + 0.1 (added 0.1 to avoid a zero value), used this normalized data to train the NN models, then compared the NN output (estimated stock price daily changes in normalized data) to the actual stock price daily changes in the normalized data. Finally, we calculated the differences of these two numbers (errors in normalized data) as the performance measures.

However, further concerns were raised that measuring the difference of differences in normalized data lost any physical meaning in stock prices; hence, our analysis did not have any basis on statistical significance. Currently, there is a lack of existing literature regarding how to address this issue. In this paper, we tried to denormalize our NN outputs and reverse the normalization process we used. The mission is to demonstrate that the forecasting performance using the Normalized Data (ND) and the Denormalized Data (DD) should produce the same result. In order to make our job easier, we manually extracted 5% of the data for testing from the original dataset before importing it to NeuroIntelligence. In this way, we did not have to hunt down each row from the huge main dataset. If this hypothesis proved to be true, we would not have to does this time-consuming denormalization process again in future research.

Hypothesis

H_0 *Forecasting performance using Normalized Data (ND) and Denormalized Data (DD) produce the same result.*

H_A *Forecasting performance using Normalized Data (ND) and Denormalized Data (DD) produce different results.*

METHODOLOGY

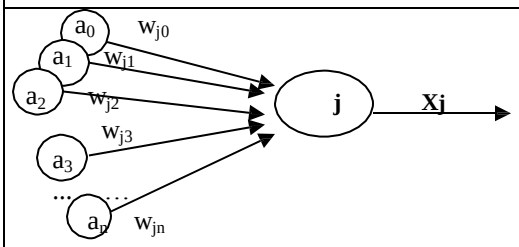
Data

The time period of this study ranges from the beginning of 2002 to the end of 2012 which was considered a high volatile period. During this period, the dot-com bubble in late 2002, the outbreak of SARS in 2003, the party leadership transitions in 2002 and 2012, global financial crisis and economic recession since 2007, the Wenchuan earthquake and the Beijing Olympic Games in 2008, all occurred. These historical events would inevitably have influences on the stock markets in China and create difficulties for market performance forecasting. 18 companies were selected as target companies from A-share of the Shanghai Stock Exchange. These companies were distributed among 9 industry sectors, such as basic materials, conglomerates, consumer goods, financial, healthcare, industrial goods, services, technology, and utilities. A total of 154 companies from A-share of the Shanghai Stock Exchange were downloaded from Yahoo Finance. A data file containing 2,664 observations was generated to record the daily close prices of these 154 companies. Additionally, 25 indicators consisting of macroeconomic indicators, market sentiment indicators, institutional investors, and microeconomic indicators were employed as independent variables to forecast the stock price changes in China's markets. One day before and one day after national holidays in China were coded as dummy variables in training the forecasting models. Data was collected through Yahoo Finance. (Refer to the Appendix for the full list of indicators.)

NN Model

One of the most significant advantages of Neural Networks (NN) lies in its ability to handle very large number of observations and variables. In this study we use five major indicators: Aggregate indicators such as global market indices, individual competitors, US and world market indices, market sentiment indicators, and institutional investors (Franklin Resources). Data were collected from National Bureau of Economic Research, Yahoo Finance, the Federal Reserve Banks, Market Vane, NYSE, and FXStreet. Altogether there are 181 variables and the detail can be found from the appendix.

Figure 1
BASIC NEURAL NETWORK MODEL



$$S_j = \sum_{i=0}^{n} a_i w_{ji}$$

where:
w_{ji} = the weight associated with the connection to processing unit j from processing unit i
a_i = the value output by input unit i.
Output of j = X_j { 0 if Sj ≤ 0 *and* 1 if Sj >0

Source: Dayhoff, J. (1990) Neural Network Architectures, New York: Van Nostrand Reinhold

A basic NN model's framework is shown in Figure 1 above. Input neurons (1 to n) are connected to an output neuron j and each connection has an assigned weight (w_{jo} to w_{jn}). In this example the output of j becomes 1 (activated) when the sum of the total stimulus (S_j) becomes great than 0 (zero). The activation function in this example used a simple unit function (0 or 1), but other functions such as Gaussian, exponential, sigmoid, or hyperbolic functions can be used for complex networks.

Backpropagation is one of the most popular learning algorithms in NN and is derived to minimize the error using the following formula:

$$E = 0.5 \sum_{p} (\sum_{k} (t_{pk} - o_{pk})^2)$$

where: p = the pattern i
k = the output unit
t_{pk} = the target value of output unit k for patter p
O_{pk} = the actual output value of output layer unit k for patter p.

Genetic Algorithm (GA) has the capabilities in pattern recognition, categorization, and association and therefore it has been widely applied in NN. Turban (1992) has shown that a genetic algorithm enables NN to learn and adapt to changes through machine learning for automatically solving complex problems based on a set of repeated instructions. GA enables NN to produce improved solutions by selecting input variables with higher fitness ratings. Alyuda NeuroIntelligence enables us to retain the best network.

Variables Used

This research applied the BI software to forecast the fluctuations in China's stock markets. 154 stocks were selected from 9 major sectors in China's market. 18 companies were picked from the 154 companies as training targets for the BI software. For each training and forecasting, one of the 18 target companies would be treated as the dependent variable for the model training. The rest of the 153 companies, as well as the 25 indicators, would become independent variables as the input for the BI software. In order to improve the accuracy of the NN models, the days pre-holiday and post-holiday were added as dummy variables, which were categorical data as an input of the model training. This research applied Alyuda NeuroIntelligence software to build the NN and forecasting models.

Table 1
LIST OF TERMS AND ABBREVIATIONS

Terms and Abbreviations	Descriptions
Training Set	The normalized data used for NeuroIntelligence to find the best architecture then to optimize the model including training and validation.
Query Set	The normalized data (5% manually extracted and separated) used for NeuroIntelligence to calculate the estimated price changes.
Actual Price Change (APC)	The daily changes of the stock prices ($C_i = P_i - P_{i-1}$) in Chinese currency (Yuan)
Normalized Actual Price Change (NAPC)	The normalized APC used for NeuroIntelligence to train the NN models
Normalized Estimated Price Change (NEPC)	The query output from NeuroIntelligence on testing data; The testing data is normalized so as the output.
Estimated Price Change (EPC)	Denormalized the NEPC to calculate the Estimated Price Change in Chinese currency (Yuan)
Error_DD	The errors of Estimation using the actual data (APC - EPC)
Error_ND	The errors of Estimation using the normalized data (NAPC - NEPC)

Training, Validation, and Testing Process

As this study focuses on comparing the differences of forecasting performance between the normalized data and the denormalized data, the daily changes of actual stock prices were separated into two data sets, including the Training set and the Query set. The original data was composed of daily changes of the 154 companies' stock prices and 25 indicators from 2002 to 2012. The Query set contained 5% of the total data. More specifically, for every 20 days in the main data set, the data of the 20th day was chosen as Query set data. The rest of the data would be the training data in Training data set. The Training set was imported into the Alyuda NeuroIntelligence software for the training of the NN models and to build a suitable model for the stock price change forecasting. The Query set was used for testing the performance of the trained NN models. Data from both the Training and the Query sets was normalized in the same method that Tjung, Kwon and Tseng (2012) did in previous research on the U.S. stock markets. After the processing and training of the Training set data in Alyuda NeuroIntelligence, the Query set data would be put into the program to generate estimated results for forecasting. Finally, the estimated results from the Query set would be denormalized for comparison.

Normalization and Denormalization Process

Since the real stock price differences could be either positive or negative, all numbers were shifted to positive numbers to gain a better forecasting performance. The normalization method in this study was based upon the previous research conducted by Tjung, Kwon and Tseng (2012), which analyzed the forecasting performance of NN models on the U.S stock markets and also applied Alyuda NeuroIntelligence as the media for processing. Furthermore, Tjung, Kwon

and Tseng (2012) pointed out that the NN models generate a lower standard deviation than traditional regression analysis do; meanwhile, the normalized data provided a better performance than the non-normalized data in terms of NN models learning and forecasting.

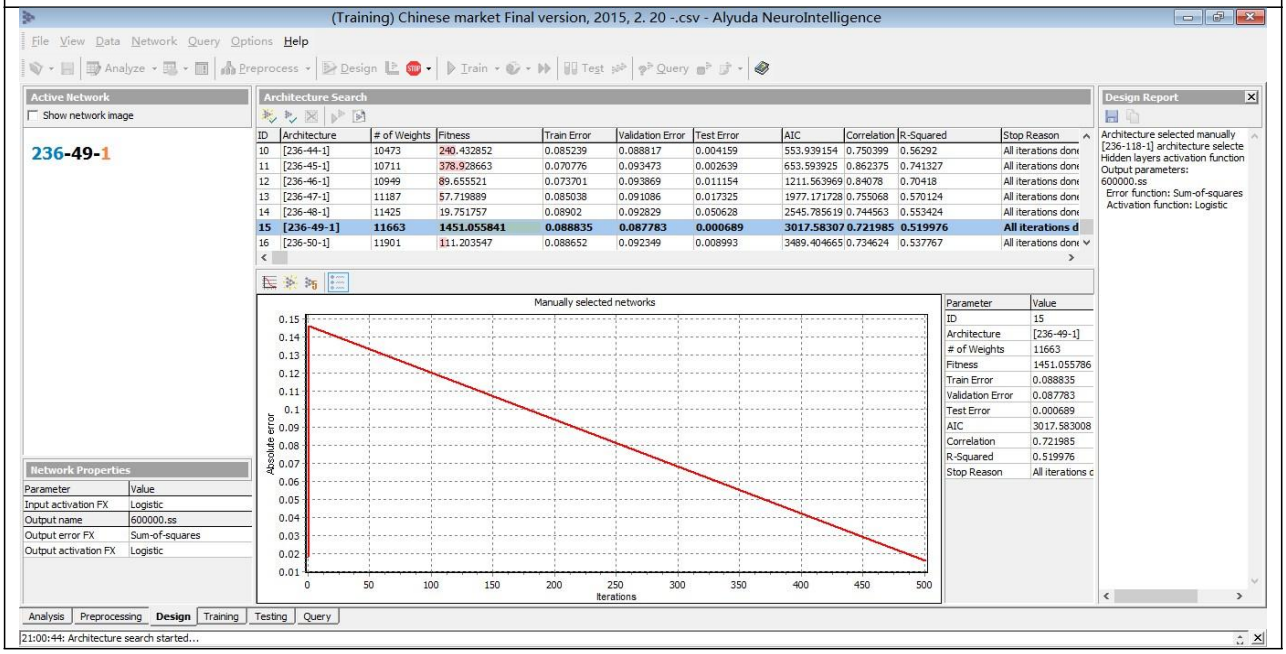
For the process of normalization, we located the minimum value (Min) of each company's daily stock price changes, took its absolute value (ABS), and then added 0.1 to avoid a zero value in the dataset. Hence the normalization value would be ((ABS (Min)) + 0.1). For instance, if Company A's minimum daily stock change is -3.4, the normalization value of Company A's data will be (ABS(-3.4) + 0.1) = 3.5. Then 3.5 would be added to all data from Company A.

After the Normalized Estimated Price Change (NEPC) was generated from the Query data set, the normalization value should be subtracted from NEPC to calculate the denormalized value, and finally got the Estimated Price Change (EPC).

Model Training

We used the Alyuda NeuroIntelligence software to build the NN models and forecast the fluctuations in China's stock markets. Alyuda NeuroIntelligence can find the best architecture for training through architecture searching function. We chose the best architecture (236-49-1) with the highest fitness when the Stock 600000 was the training target. This architecture contained 236 input neurons, 49 hidden neurons and 1 output neuron, and it was applied to the analysis of the other 17 target companies. Figure 2 below shows the best architecture with the highest fitness.

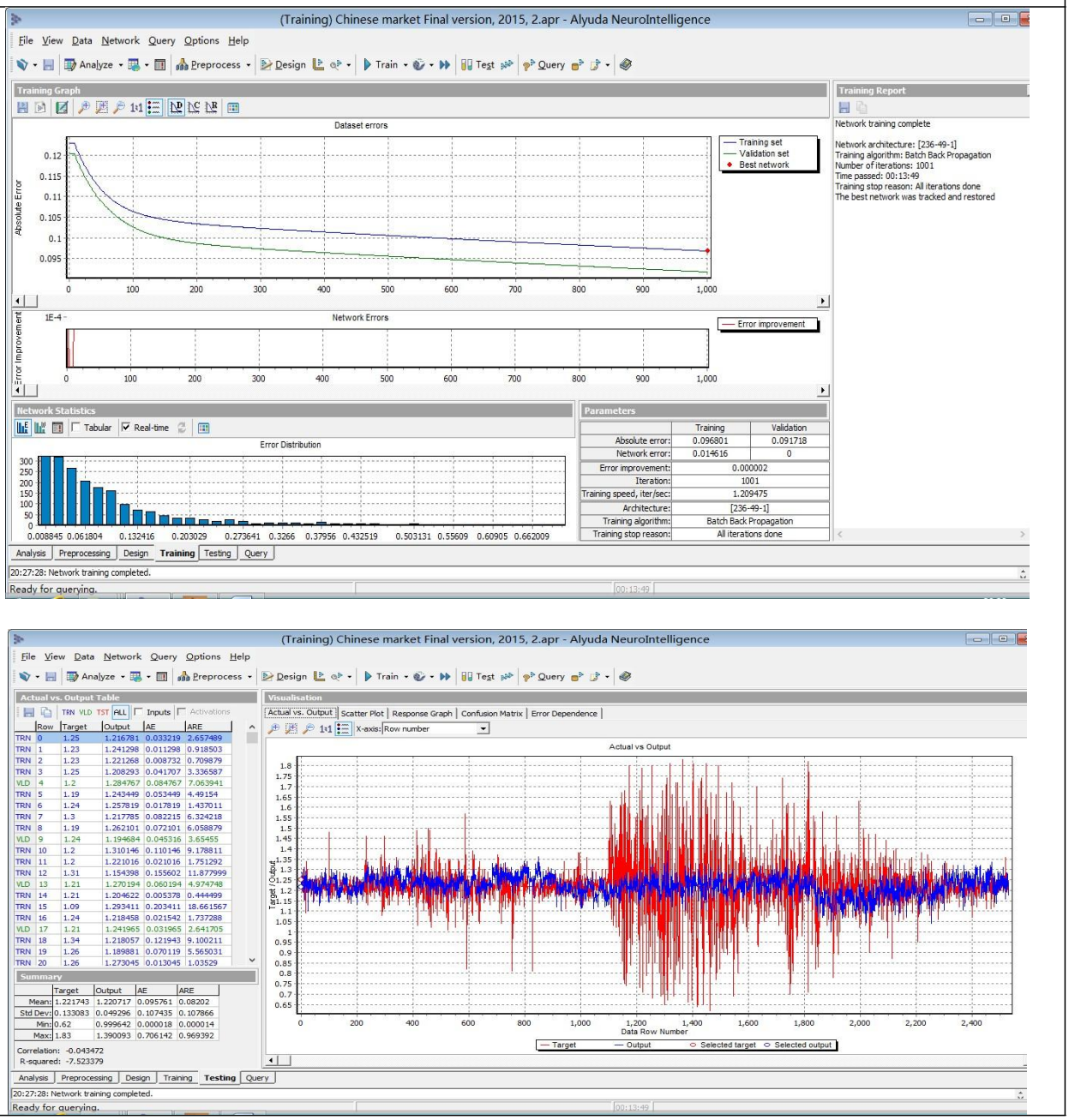
Figure 2
THE BEST ARCHITECTURE WITH THE HIGHEST FITNESS



We set 80% of the data for training and 20% for validation when training the network. Each of the target companies trained twice with 1000 iterations in each training to find the best model. After training was finished, the forecasting was performed for the same target company in the Training data set. To calculate the performance of the trained NN models, we imported the

Query data set into NeuroIntelligence; it then generated the Normalized Estimated Price Change (NEPC) of the target company. A training result of a company 600009 after 2000 iterations is shown in Figure 3 below. Due to the page limit, we removed the screen shots of training results for all other companies.

Figure 3
TRAINING RESULT OF A COMPANY 600009 AFTER 2000 ITERATIONS



ANALYSIS AND RESULTS

To test whether performance differences existed between the normalized data and the denormalized data**,** we used the paired t-test on the Error of Estimation (Error_DD) and the Error of Estimation using the normalized data (Error_ND). If the correlation between Error_DD and Error_ND is equal to 1, we should not reject H_0 in Hypothesis at any significant level. The forecasting performance on the normalization data turned out to be exactly the same as the forecasting performance on the actual price changing. The mean values and the variances are all the same for Error_DD and Error_ND. Moreover, all correlation values are equal to 1, which means that Error_ND and Error_DD are identical. Therefore, we could not reject H_O in Hypothesis at any significant level.

CONCLUSION AND FUTURE DIRECTION

During 2002 and 2012, the stock market in China showed high fluctuations and was difficult to predict. Major events happened both domestically and internationally, such as the dot-com bubble, the outbreak of SARS, the party leadership transitions, global financial crisis and economic recession, the Wenchuan earthquake and the Beijing Olympic Games. It is widely acknowledged that the influences of various pieces of information on stock prices are difficult to measure in terms of duration and significance.

We are very glad that our mission of the paper was achieved successfully. The Mean of Error_ND and the Mean of Error_DD for all 18 companies came out to be exactly the same numbers. Since the Error_ND is the error of Estimation using normalized data (NAPC - NEPC) and Error_DD is the error of Estimation (APC - EPC), we will get exactly the same results using either the normalized data or denormalized data (in actual money value). This means that we do not have to do the time consuming denormalization process for our estimated output generated by the NeuroIntelligence models in future research. We also plan to expand our research to include more techniques to build the best models for stock market forecasting.

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APPENDIX

Table A.1. Macroeconomic Indicators

Source: YahooFinance

000001.ss	SSE Composite Index
Shenzhen-A	Shenzhen Index A
Shenzhen-B	Shenzhen Index B
S&P 500	Standard & Poor's 500
DIA	Dow Jones Industrial Average ETF
AEX	Amsterdam Price
ATX	Vienna Stock Exchange
BSVP	Bovespa-Brazillian Index
CAC 40	Paris Price
DAX	German Index
FTSE 100	FTSE Index Price
HIS	Hang Seng Index
IPC (MXX)	Mexico Index
JKSE	Jakarta Stock Exchange Index
KLSE	FTSE Bursa Malaysia Klci
KOSPI	Kospi Composite Index
MERV	Merval Buenos Aires Index
N225	Nikkei 225
BSE Sensex	Bombay Stock Exchange Sensex
SMI	Swiss Market Index
STI	Straits Times Index Singapore
TSEC	Taiwan Weighted Index

Table A.2. Market Sentiment Indicators

Source: Yahoo Finance

VIX	CBOE Volatility Index
VXO	CBOE OEX Volatility Index

Table A.3. Institutional Investor

Source: Yahoo Finance

BEN	Franklin Resources Inc.

Table A.4. Microeconomic Indicators

Source: Yahoo Finance

Symbol	X Variables – Company name
BASIC MATERIALS	
600019	Baoshan Iron & Steel Co., Ltd.
600028	China Petroleum & Chemical Corporation
600075	Xinjiang Tianye Co.,Ltd
600078	Jiangsu Chengxing Phosph-Chemicals Co.
600091	Baotou Tomorrow Technology Co., Ltd
600111	Inner Mongolia Baotou Steel Rare-Earth
600117	Xining Special Steel Co.,Ltd
600123	Shanxi Lanhua Sci-Tech Venture Co Ltd
600139	Sichuan Western Resources Hld Co., Ltd
600165	Ning Xia Heng Li Steel Wire Rope Co.Ltd
600172	Henan Huanghe Whirlwind Co., Ltd.
600176	China Fiberglass Co., Ltd.
600179	HeiLongJiang HeiHua Co., Ltd.
600188	Yanzhou Coal Mining Company Limited
600219	Shandong Nanshan Aluminum Co., Ltd.
600230	Hebei Cangzhou Dahua Co.,Ltd
600231	Lingyuan Iron & Steel Co., Ltd
600255	Anhui Xinke New Materials Co., Ltd.
600256	Xinjiang Guanghui Industry Co., Ltd.
600281	Taiyuan Chemical Industry Co., Ltd
600282	Nanjing Iron & Steel Co.,Ltd.
600291	Xishui Strong Year Co.Ltd Inner Mongolia
600293	Hubei Sanxia New Building Materials Co.,
600301	Nanning Chemical Industry Co., Ltd
600307	Gansu Jiu Steel Group Hongxing Iron
600311	Gansu Ronghua Industry Group Co., Ltd.
600318	Anhui Chaodong Cement Co., Ltd
600319	Weifang Yaxing Chemical Co., Ltd.
600331	Sichuan Hongda Co., Ltd
600333	Changchun Gas Co., Ltd
600339	Xinjiang Dushanzi Tian Li High & New Tech Co
600367	Guizhou Redstar Developing Co., Ltd
600378	Sichuan Tianyi Science & Tech. Co., Ltd
600381	Qinghai Sunshiny Mining Co., Ltd.
600390	Kingray New Materials Science & Tech Co
600395	Guizhou Panjiang Refined Coal Co., Ltd
600399	Fushun Special Steel Co., Ltd.
CONGLOMERATES	
600149	C & T Technology Development Co. Ltd
600200	Jiangsu Wuzhong Industrial Co., Ltd
600212	Shandong Jiangquan Industry Co., Ltd
600260	Kaile Science and Tech. Co.,Ltd. Hubei
CONSUMER GOODS	
600006	Dongfeng Automobile Co., Ltd
600073	Shanghai Mailing Aquarius Co., Ltd

600074	Jiangsu Zhongda New Material Grp Co Ltd
600084	Citic Guoan Vine Co.,Ltd.
600086	Hubei Eastern Gold Jade Co., Ltd.
600090	Xin Jiang Hops Co., Ltd.
600093	Sichuan Hejia Co., Ltd
600097	ShangHai Kaichuang Marine Int'l Co.,Ltd
600103	Fujian Qingshan Paper Industry Co., Ltd
600108	Gansu Yasheng Industrial (Group) Co. Ltd
600127	Hunan Jinjian Cereals Industry Co., Ltd.
600132	Chongqing Brewery Co., Ltd
600156	Hunan Huasheng Co., Ltd.
600166	Beiqi Foton Motor Company Limited
600177	Youngor Group Co., Ltd.
600182	Giti Tire Corporation
600186	Henan Lotus Gourmet Powder Inc.
600191	Baotou Huazi Industry Co., Ltd
600197	Xinjiang Yilite Industry Co., Ltd.
600202	Harbin Air Conditioning Co Ltd
600220	Jiangsu Sunshine Co., Ltd
600232	Zhejiang Golden Eagle Co., Ltd
600233	Dalian Dayang Trands Co., Ltd
600257	Dahu Aquaculture Co.,Ltd.
600261	Zhejiang Yankon Group Co., Ltd.
600265	Yunnan Jinggu Forestry Co., Ltd.
600298	Angel Yeast Co., Ltd.
600300	V V Food & Beverage Co., Ltd
600303	Liaoning SG Automotive Group Co., Ltd.
600308	Shandong Huatai Paper Company Limited
600337	Markor International Furniture Co., Ltd.
600356	Mudanjiang Hengfeng Paper Co., Ltd
600365	Tonghua Grape Wine Co., Ltd
600400	Jiangsu Hongdou Industry Co.,Ltd
600419	Xinjiang Tianhong Papermaking Co., Ltd.
FINANCIAL	
600000	Shanghai Pudong Development Bank Co. Ltd
600007	China World Trade Center Co. Ltd.
600016	China Minsheng Banking Corporation Ltd.
600052	Zhejiang Guangsha Co., Ltd.
600061	Sinotex Investment & Development Co.
600109	Sinolink Securities Co., Ltd.
600162	Shenzhen Heungkong Holding Co., Ltd.
600193	Xiamen Prosolar Realestate Co.,Ltd
600215	Changchunjingkai (Group) Co., Ltd.
600223	Lushang Property Co., Ltd.
600239	YunNan Metropolitan Real Estate Devel Co
600240	Beijing Huaye Real Estate Co., Ltd
600275	Hubei Wuchangyu Co., Ltd
600322	Tianjin Realty Development (Group)Co Ltd
HEALTHCARE	
600055	Beijing Wandong Medical Equipment Co Ltd
600062	Beijing Double-Crane Pharmaceutical Co.
600079	Wuhan Humanwell Hi-tech Ind. Co., Ltd.
600080	Ginwa Enterprise (Group) Inc.
600085	Beijing Tongrentang Co., Ltd.
600195	China Animal Husbandry Industry Co., Ltd
600201	Inner Mongolia Jinyu Group Co Ltd
600211	Tibet Rhodiola Pharmaceutical Holding Co
600216	Zhejiang Medicine Co., Ltd.
600267	Zhejiang Hisun Pharmaceutical Co., Ltd.
600297	Merro Pharmaceutical Co.,Ltd.

600380	Joincare Pharmaceutical Group Ind. Co.
600385	Shandong Jintai Group Co.,Ltd.
600466	Sichuan Di Kang Sci&Tech Pharm. Ind. Co.
600488	Tianjin Tianyao Pharmaceutical Co., Ltd
INDUSTRIAL GOODS	
600089	TBEA Co., Ltd
600150	China CSSC Holdings Limited
600169	Taiyuan Heavy Industry Co., Ltd.
600243	QingHai HuaDing Industrial Co., Ltd.
600290	Huayi Electric Co., Ltd.
600302	Xi'an Typical Industries Co.,Ltd.
600320	Shanghai Zhenhua Heavy Industry Co.,Ltd
600335	Dingsheng Tiangong Const. Mach. Co., Ltd
600388	Fujian Longking Co., Ltd
SERVICES	
600009	Shanghai International Airport Co., Ltd.
600051	Ningbo United Group Co. , Ltd.
600054	Huangshan Tourism Development Co., Ltd
600115	China Eastern Airlines Corporation Ltd.
600122	Jiangsu Hongtu High Technology Co., Ltd.
600125	China Railway Tielong Container Log. Co.
600136	Wuhan Double Co.,Ltd
600138	China CYTS Tours Holding Co., Ltd
600190	Jinzhou Port Co., Ltd.
600203	Fujian Furi Electronics Co., Ltd.
600221	Hainan Airlines Co., Ltd.
600241	Liaoning Shidai Wanheng Co.Ltd
600242	Guangdong Hualong Groups Ltd. Co.
600250	Nanjing Textiles Import & Export Corp.
600258	Beijing Capital Tourism Co., Ltd
600270	Sinotrans Air Transportation Devel. Co
600272	Shanghai Kai kai Industrial Company Ltd.
600278	Orient International Enterprise, Ltd.
600279	Chongqing Gangjiu Co., Ltd
600306	Shenyang Commercial City Co. Ltd
600361	Beijing Hualian Hypermarket Co., Ltd.
600382	Guangdong Mingzhu Group Co., Ltd.
TECHNOLOGY	
600100	Tsinghua Tongfang Co., Ltd
600130	Ningbo Bird Co. , Ltd .
600151	Shanghai Aero Auto Electromechanical
600185	Xi' An Seastar Modern-Tech Co., Ltd.
600198	Datang Telecom Technology Co., Ltd
600288	Daheng New Epoch Technology, Inc.
600330	TDG Holding Co., Ltd.
600345	Wuhan Yangtze Communication Industry
600360	Jilin Sino-Microelectronics Co., Ltd
600366	Ningbo Yunsheng Co., Ltd.
600498	Fiberhome Telecommunication Tech. Co. Ltd
UTILITIES	
600101	Sichuan Mingxing Electric Power Co., Ltd
600168	Wuhan Sanzhen Industry Holding Co., Ltd
600207	Henan Ancai Hi-tech Co., Ltd
600283	Qian Jiang Water Resources Development
600292	Chongqing Jiulong Electric Power Co. Ltd
600310	Guangxi Guidong Electric Power Co., Ltd
600396	Shenyang Jinshan Energy Co., Ltd

A CANONICAL RANKING OF THE DETERMINANTS OF SHARE PRICE LIQUIDITY

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ABSTRACT

Share price liquidity has been a favored topic in financial research and business journals for years. Many previous studies have been concerned with the speed and sureness with which a share of common stock can be turned into cash. Most investors, and surely the less sophisticated investors, feel the need to abandon a stock position when the market or the value of that security falls. Thus, the liquidity of their holdings is paramount to some investors. However, more often than not, the abandonment of a stock position when the value of the security falls is too late. If indeed the security was a good investment when it was purchased, many investors will stay with the security expecting recovery. Institutional investors are less concerned with liquidity and have more patience with small fluctuations in price. Regardless, no investor, including institutional investors, will buy any security unless they have assurance that if the need arises, they can sell those securities. Companies experience different demand for their equity shares and thus different levels of liquidity. That demand is a function of the perception of investors who are willing and able to buy. Those investors trade off basic measures of risk and return to establish that demand. The purpose of this study is to create a financial risk-return profile of those firms with the highest share price liquidity, to compare that profile with companies selected at random, and to rank those factors that influence share price liquidity. As in previous studies of this nature those factors are analyzed using multiple discriminant analysis, and ranked with canonical correlation.

INTRODUCTION

A major purpose of all secondary markets is to provide liquidity for the securities traded on those markets. Thus, organized exchanges add efficiency to the market, and they add to the level of liquidity for shares traded on those markets. There have been many studies on the subject of share price liquidity. Kemp (2014) explained clearly how share price liquidity (SPL) would be of paramount importance to traders, but of less importance to "true investors." In addition, he provided alternative methods of computing SPL and raised the question: Do illiquid stocks typically trade at lower prices? His finding was that while it appears that such discounts do exist, quantifying them is difficult. Amihud, et al. (2005) reviewed the theories on how liquidity affects the required returns of capital assets, and the empirical studies that test those theories. The authors found that theory predicts that the level of liquidity is priced, and further that the results of empirical studies found that the effects of liquidity on asset prices to be statistically significant and economically important (Amihud, et al. (2005). It would not be difficult to argue that no investor, including institutional investors, will buy any security unless they have assurance that if the need arises, they can sell those securities.

The metric used in this study to measure share price liquidity is the share turnover ratio (STR). It may be defined as:

STR = The Average Daily Trading Volume / The total number of outstanding shares minus those shares owned by insiders and treasury stock retained by the company (Kemp 2014). (1)

Where:

The average trading volume can be the average for the past 30 days or the past 10 days. Both averages are given by Yahoo Finance.

Issuing companies experience different levels of demand for their equity shares and thus different levels of liquidity. That demand is a function of the perception of investors at the margin (those who are willing and able to buy). Those investors trade off basic measures of risk and return to establish that demand.

The purpose of this study is to establish a financial profile of those firms identified as having the highest share turnover ratios in the database of over 5000 firms created by (Damodaran 2014) from Bloomberg, Morningstar and Compustat. Specifically, the analysis will test for significant differences in the financial profiles of firms with the highest share turnover ratios and to compare those profiles with companies selected at random. If the two groups of firms have unique financial profiles, and the model can be validated without bias, it suggests that the profile may be used as a tool to forecast companies that will maintain high STR in future periods. The use of such a new tool to forecast higher levels of liquidity would have implications for investors, managers, lenders, investment counselors, and academicians.

METHODOLOGY

The issues to be resolved are first, classification or prediction, and then evaluation of the accuracy of that classification. More specifically, can firms be assigned, on the basis of selected financial variables, to one of two groups: (1) firms that were identified as having the highest share turnover ratios in their database simply referred to here as highest (HSTR) or, Firms Randomly Chosen (FRC)? That is, the firms with the very highest ratios in the database were compared firms that were randomly chosen from that same database that did not qualify for the HSTR group.

Multiple Discriminant Analysis (MDA) provides a procedure for assigning firms to predetermined groupings based on variables or attributes whose values may depend on the group to which the firm actually belongs, and canonical correlation ranks those variables in order of their weighted effects on the results of the analysis. If the purpose of the study were simply to establish a financial profile of each group of firms, simple ratios would be adequate. However, as early as 1968, in a seminal paper on the use of MDA in finance, Altman showed that sets of variables used in multivariate analysis were better descriptors of the firms, and had more predictive power than individual variables used in univariate tests.

The use of MDA in the social sciences for the purpose of classification is well known. MDA is appropriate when the dependent variables are nominally or ordinally measured and the predictive variables are metrically measured. In addition to its use in the Altman study to predict corporate bankruptcy, other early studies used MDA to predict financially distressed property-liability insurance firms (Trieschmann and Pinches 1973), to determine value (Payne 2010), and the failure of small businesses (Edmister 1982). This study also employs nominally measured dependent variables and metrically measured predictive variables. The nominally measured dependent variables are the group of high HSTR firms and the group of FRC firms. The computer program used to perform the analysis is SPSS 21.0 Discriminant Analysis (SPSS Inc.

2012). Since the objective of the analysis is to determine the discriminating capabilities of the entire set of variables without regard to the impact of individual variables, all variables were entered into the model simultaneously. This method is appropriate since the purpose of the study was not to identify the predictive power of any one variable, but instead the predictive power of the entire set of independent variables (Hair, et al. 1992).

SELECTION OF SAMPLE AND INDEPENDENT VARIABLES

Given the conclusions of Kemp (2014), (Amihud, et al. (2005) and others, that the results of empirical studies found that the effects of liquidity on risk and asset prices to be statistically significant and economically important, the share price liquidity is used here as a subject of this study.

All data used in the analysis were gathered from Domodaran's 2014 set. The sample selected for this study consists of two groups. The high stock turnover ratio group contains 1016 observations and the FRC group has 603 observations. The sample is large enough that as long as the variance covariance matrices are equal, it renders the difference in the size of the groups insignificant, and of course, the sample gathered simply exhausted Domodaran's database in the HSTR category.

Previous studies using this and other statistical methods have chosen explanatory variables by various methods and logical arguments. In this study the group of explanatory variables chosen for analysis includes one measure of size, one measure of how the company may be perceived by investors at the margin, two measures of return, or potential return on investment and finally three measures of risk. An evaluation of those measures is needed to accomplish the purpose of this study. A basic tenet of this study is that all investors "trade off" indicators of risk and return to establish the value of the firms.

Following are the seven explanatory variables:

X_1 *Investors may perceive that the larger the firm, the more well-known it would be, and thus the more liquid the shares. However, the greater the number of outstanding shares, the greater will be the number of investors required to maintain the intrinsic value in share price. Given the efficiency of today's markets, and the speed with which good and bad news is absorbed into the market, large firms may not have a share liquidity advantage over small and mid-sized firms. There is very little literature regarding size effects on share price liquidity. However, there is an aprori expectation that larger firms will experience greater share price liquidity. The measure of size used in this study is the market capitalization.*

X_2 *The enterprise value multiple is included here as a measure of how investors in the market perceive the firm. It has been described as how much an acquiring from would have to pay to take over a company, and that number is divided by the company's latest earnings before interest and taxes plus depreciation and amortization (EBITDA). It is more commonly referred to as the enterprise value multiple, and it is said to be roughly analogous to the payback period. Reese (2013) offered the opinion that the significance of the enterprise value multiple (EVM) lies in its ability to compare companies with different capital structures, and that by using the EVM instead of market capitalization to look at the value of a company, investors get a more accurate sense of whether or not a company is truly valued.*

X_3 *One measure of return is return to total capital. Return to total capital includes a return to creditors as well as owners, and recognizes that value is affected by the cost of debt. A measure of return to equity could be used, but it would ignore the cost of debt and the fact that debt as well as equity is used to finance assets. This is consistent with the use of the debt to total capital ratio as a measure of financial leverage*.

X_4 *Growth may also be regarded as a return on capital, and indeed growth has been of interest to financial investors for years, and all investors as well as financial managers value expected growth more than historical growth. In this study Damodaran's (2014) expected five-year change in earnings per share was used.*

X_5 *There is in any company both financial risk (financial leverage) and operating risk (operating leverage). Sharpe's beta coefficients contain the effects of both operating and financial risk. It is customary in modern research to separate the two types of risk to identify and compare the sources of risk. The separation is accomplished by using Hamada's (1972) equation to "unlever" the published betas. Damodran (2014) used that equation to unlever the "bottom up" sector betas. Those betas are used here as a measure of operating leverages (operating risk that results from fixed operating costs).*

X_6 *Financial leverage (financial risk resulting from fixed finance costs) is measured here by use of the long term debt to total invested capital ratio (DTC). That ratio is used here as a measure of financial leverage. There are other ratios that measure financial risk very well, but the long-term debt to total capital ratio again recognizes that the firm is financed by creditors as well as owners.*

X_7 *The seventh explanatory variable is the coefficient of variation in earnings before interest and taxes (EBIT). The coefficient of variation (CV) standardizes the relative variance in EBIT among companies, and allows comparison of those variances in relation to the expected value of EBIT for each company in the dataset. The greater the CV, the greater is the risk in relation to the expected EBIT. Thus, it is included here as a measure of a different type of risk than indicated by the above two leverage ratios.*

In sum, there are seven explanatory variables in the multiple discriminant model. They are as follows:

X1 - Market Capitalization (Size)
X2 - The Enterprise Value Multiple
X3 - Return on Total Capital
X4 - The Five Expected Year Growth Rate
X5 - The Bottom Up Unlevered Sector Beta (Operating Risk)
X6 - Long Term Debt to Total Capital (Financial Risk)
X7 - The Coefficient of Variation in EBIT

The explanatory variable profile contains basic measures of common financial variables. They were chosen, as in any experimental design, because of their consistency with theory, adequacy in measurement, the extent to which they have been used in previous studies, and their availability from a reputable source. Other explanatory variables could have been added, however their contributions to the accomplishment of the stated purpose of the study would have been negligible. When there are a large number of potential independent variables that can be used, the general approach is to use the fewest number of explanatory variables that accounts for a sufficiently large portion of the discrimination procedure (Zaiontz 2014). The more accepted practice is to use only the variables that logically contribute to the accomplishment of the study's purpose (Suozzo 2001). This study is consistent with both references.

TESTS AND RESULTS

The discriminant function used has the form:

$$Z_j = V_1X_{1j}+V_2X_{2j}+\ldots\ldots+V_nX_{nj} \quad (2)$$

Where:

X_{ij} is the firm's value for the ith independent variable.
V_i is the discriminant coefficient for the firm's jith variable.
Z_j is the jth individual's discriminant score.

The function derived from the data in this study and substituted in equation 1 is:

$$Z_j = -2.319 + .0001X_1 + .0001X_2 + .007_3 + .031X_4 + 2.552X_5 + .005X_6 - 13.675X_7 \quad (3)$$

Classification of firms is relatively simple. The values of the seven variables for each firm are substituted into equation (5). Thus, each firm in both groups receives a Z score. If a firm's Z score is greater than a critical value, the firm is classified in group one high (HSTR). Conversely, a Z score less than the critical value will place the firm in group two (FRC). Since the two groups are heterogeneous, the expectation is that HSTR firms will fall into one group and the FRC firms will fall into the other. Interpretation of the results of discriminant analysis is usually accomplished by addressing four basic questions:

1. Is there a significant difference between the mean vectors of explanatory variables for the two groups of firms?
2. How well did the discriminant function perform?
3. How well did the independent variables perform?
4. Will this function discriminate as well on any random sample of firms as it did on the original sample?

To answer the first question, SPSS provides a Wilk's Lamda – Chi Square transformation (Sharma 1996). The calculated value of Chi-Square is 17.78. That exceeds the critical value of Chi-Square 14.067 at the five percent level of significance with 7 degrees of freedom. The null hypothesis that there is no significant difference between the financial profiles of the two groups is therefore rejected, and the first conclusion drawn from the analysis is that the two groups have significantly different financial characteristics. This result was of course, expected since one group of firms experienced very high free cash flow yields and the other group was chosen randomly. The discriminant function thus has the power to separate the two groups. However, this does not mean that it will in fact separate them. The ultimate value of a discriminant model depends on the results obtained. That is what percentage of firms was classified correctly and is that percentage significant?

To answer the second question a test of proportions is needed. The firms that were classified correctly are shown on the diagonal in Table I. Of the total of 1,619 firms in the dataset 1,016 or 62.8 percent were classified correctly.

Table 1
CLASSIFICATION RESULTS
Predicted Results
HSTR - FRC Classification

Actual Results	HSTR	FRC
HSTR	974	574
FRC	29	42

To determine whether 62.8 percent is statistically significant, formal research requires the proof of a statistical test. In this case, the Press's Q test is appropriate (Hair, et al. 1992, 106). Press's Q is a Chi-square random variable:

$$\text{Press's Q} = [N-(n \times k)]^2 / N(k-1) \quad (4)$$

where:

N = Total sample size
n = Number of cases correctly classified
k = Number of groups

In this case:

$$\text{Press's Q} = [1619 - (1016 \times 2)]^2 / [1619\,(2-1)] = 105.35 > \chi^2_{.05}\ 3.84 \text{ with one d. f.} \quad (5)$$

Thus, the null hypothesis that the percentage classified correctly is not significantly different from what would be classified correctly by chance is rejected. The evidence suggests that the discriminant function performed very well in separating the two groups. Again, given the disparity of the two groups, and the sample size, it is not surprising that the function classified 62.8 percent correctly.

The arithmetic signs of the adjusted coefficients in Table 2 are important to answer question number three. Normally, a positive sign indicates that the greater a firm's value for the variable, the more likely it will be in group one, the HSTR group. On the other hand, a negative sign for an adjusted coefficient signifies that the greater a firm's value for that variable, the more likely it will be classified in group two, the FRC group. Thus, according to Table 2, the greater the following variables: The size of the firm, The return to total capital, the degree of operating risk, the five year expected growth rate, and the enterprise value multiple, the more likely the firm would have achieved a higher level of share price liquidity. Conversely, the greater the variance in EBIT, and the greater the level of financial leverage less likely the firm would have achieved a high level of share price liquidity.

The relative contribution of each variable to the total discriminating power of the function is indicated by the discriminant loadings, referred to by SPSS as the pooled within-groups correlations between discriminating variables and canonical function coefficients, or more simply their structure matrix. Those structure correlations are indicated by canonical correlation coefficients that measure the simple correlation between each independent variable and the Z scores calculated by the discriminant function. The value of each canonical coefficient will lie between +1 and -1. Multicollinearity has little effect on the stability of canonical correlation coefficients, in contrast to the discriminant function coefficients where it can cause the measures to become unstable. (Sharma 1996, 254). The closer the absolute value of the loading to 1, the stronger the relationship between the discriminating variable and the discriminant function These discriminant loadings are given in the output of the SPSS 21.0 program, and shown here with their ranking in Table 2.

Table 2
RELATIVE CONTRIBUTION OF THE VARIABLES

Discriminant Variables	Coefficient	Rank
Market Capitalization (Size)	.518	1
Return on Total Capital	.493	2
The Unlevered Sector Beta (Operating Risk)	.447	3
The Coefficient of Variation in EBIT	-.408	4
The Five Year Expected Growth Rate	-.287	5
Long Term Debt to Total Capital (Financial Risk)	-.179	6
The Enterprise Value Multiple	.093	7

Table 2 reveals that market capitalization, the measure for size made the greatest contribution to the overall discriminating function. It is followed respectively by the measure return to total capital, the measure of operating risk, the coefficient of variation for EBIT, the five year expected growth rate, the measure for financial leverage, and finally the enterprise value multiple. Some multicollinearity may exist between the predictive variables in the discriminant function, since both return and risk could be reflected in the institutional investors buying activity. Hair, et al. (1992) wrote that this consideration becomes critical in stepwise analysis and may be the factor determining whether a variable should be entered into a model. However, when all variables are entered into the model simultaneously, the discriminatory power of the model is a function of the variables evaluated as a set and multicollinearity becomes less important. More importantly, the rankings of explanatory variables in this study were made by the canonical correlation coefficients shown in Table 2. As discussed the previous paragraph, those coefficients are unaffected by multicollinearity (Sharma, 1996).

VALIDATION OF THE MODEL

Before any general conclusions can be drawn, a determination must be made on whether the model will yield valid results for any group of randomly drawn firms. The procedure used here for validation is referred to as the Lachenbruch or, more informally, the "jackknife" method. In this method, the discriminant function is fitted to repeatedly drawn samples of the original sample. The procedure estimates (k – 1) samples, and eliminates one case at a time from the original sample of "k" cases (Hair, et al. 1992). The expectation is that the proportion of firms classified correctly by the jackknife method would be less than that in the original sample due to the systematic bias associated with sampling errors. In this study there was a difference of only two firms. At first glance a reader might conclude that it is unusual to complete an analysis of this size and have a difference of only eight firms between the two groups. However, with a very large sample such as the 1619 companies used in this study, the differences seem to diminish. The major issue is whether the proportion classified correctly by the validation test differs significantly from the 62.8 percent classified correctly in the original test. That is, is the difference in the two proportions classified correctly by the two tests due to bias, and if so is that bias significant? Of course, it may be obvious that a difference of only eight cases will not be significant with a sample of 1619 companies. However, as in the aforementioned case of the Press's Q test of proportions, formal research requires the proof of a statistical test. The jackknife validation resulted in the correct classification of 62.3 percent of the firms. Since there are only two samples for analysis the binomial test is appropriate:

$$t = r - n\ p\ /\ [n\ p\ q]^{1/2} \quad (6)$$

Where:

t is the calculated t statistic
r is the number of cases classified correctly in the validation test.
n is the sample size.
p is the probability of a company being classified correctly in the original test.
q is the probability that a firm would be misclassified in the original test.

In this case: $1008 - 1619\ (.628)\ /\ [1619\ (.628)\ (.372)]^{½} = -.045$ is less than t_{05} 1.645. (7)

Thus, the null hypothesis that there is no significant difference between the proportion of firms classified correctly in the original test and the proportion classified correctly in the validation test cannot be rejected. Therefore, it can be concluded that while there may be some bias in the original analysis, it is not significant and it is concluded that the procedure will classify new firms as well as it did in the original analysis.

In addition to the validation procedure, researchers usually address the question of the equality of matrices. This is especially important in studies such as this where there is disparity in the size of the groups. One of the assumptions in using MDA is that the variance-covariance matrices of the two groups are equal. The SPSS program tests for equality of matrices by means of Box's M statistic. In this study Box's M transformed to the more familiar F statistic of 25.95 resulted in a zero level of significance. Thus, the null hypothesis that the two matrices are equal cannot be rejected.

SUMMARY AND CONCLUSIONS

The purpose of this study was to establish a financial profile of those firms identified as having the highest share price liquidity in the database of 1619 firms created by (Damodaran 2014). Specifically, the analysis tested for significant differences in the financial profiles of firms with the highest share turnover ratios and to compare those profiles with companies selected at random. In this study the group of explanatory variables chosen for analysis includes one measure of size, one measure of how the company may be perceived by investors at the margin, two measures of return, or potential return on investment and finally three measures of risk. Investors at the margin "trade off" these and other indicators of risk and return to buy and sell securities. It is the buying and selling of those investors that establish the market value of both equity and debt.

The results of the statistical analysis indicated first, that there was a significant difference in the financial profiles of the two groups of firms. The fact that the discriminant function separated two heterogeneous groups, and classified a significant proportion correctly is no surprise. In fact, the two groups of firms were so diverse in the matter of achieving share price liquidity that it would certainly have been a surprise if the discriminant function had not been so efficient.

Table 2 reveals that the greater the following variables: The size of the firm, The return to total capital, the degree of operating risk, the five year expected growth rate, and the enterprise value multiple, the more likely the firm would have achieved a higher level of share price liquidity. Conversely, the greater the variance in EBIT, and the greater the level of financial leverage the less likely the firm would have achieved a high level of share price liquidity. Explanations as to why the

variables are associated with one group or the other are beyond the scope of this study. However, a few comments on the findings may be in order. Five of these of these results may have been expected, one variable had no apriori expectation (The relationship was simply not known), and one was a surprise. Greater size, greater returns to total capital, greater rates of growth, less variance in EBIT, and less financial leverage could all have intuitive aprori expectations of association with greater share price liquidity. The fact that greater operating leverage was associated with greater share price liquidity was simply not known beforehand. It may be suggested that higher operating leverage (fixed operating costs) is associated with greater size, and size was the highest ranking discriminating variable in the model. There are exceptions of course, but larger firms usually have larger corporate bureaucracies and other fixed operating costs and that adds to operating leverage (operating risk).

The study resulted in one surprise. The enterprise value multiple was expected to have a negative association with share price liquidity. The numerator in the multiple is enterprise value and that of course contains debt and minority interests as well as market capitalization. That number is divided by the company's latest earnings before interest and taxes plus depreciation and amortization. Enterprise value has been described as how much an acquiring from would have to pay to take over a company, When divided by EBITDA it is said to be roughly analogous to the payback period. Thus, the smaller the denominator (EBITDA), the greater the enterprise value multiple. The value of the firm is a partial function of EBITDA, and it is seemingly not reasonable that smaller values of EBITDA can be associated with share price liquidity. This finding is consistent with previous research (Wong, Castater, and Payne 2015). No explanation of this empirical result can be offered here, and it may indeed defy logic. However, that finding as well as the other conclusions of the study is rich in content for needed further research.

This study has resulted in a contribution toward the construction of a theory that describes the risk-return, size and market perception characteristics of firms that have achieved the highest levels of share price liquidity It is further suggested that since the model was validated without bias, it can be used to predict firms that may achieve high levels of share price liquidity in the future. In order to make a more complete contribution to the theory, the aforementioned further research is needed. The evolution and appearance of a complete theory would aid managers, investors, academicians, and investment counselors by providing greater of knowledge on which to base financial decisions.

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THE FRAUD TRIANGLE AS A PREDICTOR OF CORPORATE FRAUD

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ABSTRACT

We test whether proxies for elements of the fraud triangle are related to fraudulent corporate behavior. We use Accounting and Auditing Enforcement Releases from 2003 through 2010 to form a sample of 103 firms with violations and compare their characteristics to a matched sample of control firms. We find significant explanatory variables representing all three sides of the fraud triangle; including opportunity, pressure and rationalization. SEC violations are more likely when the board of directors has fewer women, longer tenure, more insiders, and the CEO is also the chairperson. Fraud is also more likely when managers and directors are compensated with stock options and when there has been a recent auditor change.

INTRODUCTION

Despite extensive accounting reforms, investors' faith in the integrity of corporate executives and the accuracy of their financial reports remains compromised. In 2014, the American Institute of Certified Public Accountants (AICPA) redrafted a clarified Statement of Auditing Standards AU-C 240, "Consideration of Fraud in a Financial Statement Audit". The goal of AU-C 240 is to increase the effectiveness of auditors in detecting fraud through the assessment of firms' fraud risk factors based on Cressey's (1953) fraud risk theory. While Cressey's framework is widely accepted by accounting professionals, academics, and various regulatory agencies, there is limited empirical evidence linking Cressey's theory to financial statement fraud in a corporate setting.

Cressey concluded that three conditions (opportunity, pressure, and rationalization) are always present when embezzlement occurs. We empirically test the effectiveness of his fraud risk factor framework adopted in AU-C 240 by developing variables that serve as proxy measures for opportunity, pressure, and rationalization.

Our comprehensive study is based on the *Accounting and Auditing Enforcement Releases* (AAERs) issued by the *Securities and Exchange Commission* (SEC) from 2003 through 2010. Characteristics of 103 firms with fraud violations are compared to those of a matched sample of 103 control firms. The paper contributes to the existing literature by extending Cressey's theory on embezzlement by individuals to corporate fraud that often involves collaboration. Our study examines fraud by U.S. firms in the post-Sarbanes-Oxley period, while most research has been based on non U.S. firms or earlier periods. In addition, our sample is based on all types of SEC violations, compared to other studies that looked at samples of firms with selected violations or financial restatements not necessarily associated with fraud.

We find significant explanatory variables representing all three sides of the fraud triangle; including opportunity, pressure and rationalization. SEC violations are more likely when the board of directors has fewer women, longer tenure, more insiders, and the CEO is also the chairperson. Fraud is also more likely when managers and directors are compensated with stock

options and when there has been a recent auditor change. These results are consistent with the fraud triangle and have important policy implications.

The next section of this paper reviews the relevant literature. Section 3 describes our data and model development, Section 4 presents our results, and Section 5 includes a summary and policy implications.

LITERATURE REVIEW

Cressey's (1953) fraud risk factor theory concluded that fraudulent actions share three common traits. First the "trust violator" has the opportunity to commit fraud, typically due to absent or ineffective controls. Second there is a perceived financial need or pressure providing motivation to commit fraud. Finally, those involved have the ability to rationalize that the fraudulent act is justified and consistent with their values. The Statement of Auditing Standards AU-C 240 provides a framework to position previous research in the context of all three sides of the fraud triangle (opportunity, pressure, and rationalization).

Opportunity

AU-C 240 Appendix A provides examples of opportunities to commit fraud, such as ineffective monitoring of managers by an ineffective board of directors, high turnover rates, and the domination of management by a single person.

Segregation of the Board Chair and CEO Positions

The board of directors' monitoring role can be hindered when the CEO serves as board chair (Beasley & Salterio, 2001). Jensen (1993) argued that it is important to separate the chair and CEO positions to have an effective board. Dechow, et al. (1996) provided evidence of association between earnings management and the CEO simultaneously serving as chair. Beasley and Salterio (2001) showed firms that separate the chair and CEO positions are more likely to voluntarily improve the quality of their audit committees by including more outsiders. On the other hand, Ghosh, Mara, and Moon (2010) and Lou and Wang (2009) found no relationship between earnings management and separation of the chair and CEO positions.

Director Length of Tenure

The literature presents two conflicting views on the relationship between director tenure length and the effectiveness of boards. More experienced directors who have served longer on the board can provide better knowledge about the firm and be more efficient in decision making (Libit & Freier, 2015). Ghosh, et al. (2010) analyzed the post-Sarbanes-Oxley years and reported a negative relationship between the average tenure of audit committee directors and discretionary accruals. This suggests that audit committee directors with longer tenure are more effective in mitigating earnings management. On the other hand, more seasoned directors have been shown to lose their independence over time and favor management's interests over shareholders' (Vafeas, 2005). Directors who have served for an extended time are also likely to befriend management (Vafeas, 2003).

Women on the Board

A growing body of literature focuses on the role of female directors in board effectiveness. Gavious, Segev, and Yosef (2012) found a negative relationship between the presence of female directors and earnings management. They argued that aggressive accounting decisions are mitigated in proportion to the number of women on the board of directors and the audit committee. Srinidhi, Gul, and Tsui (2011) showed that female board participation is associated with higher quality of reported earnings. Adams and Ferreira (2009) found that female directors have significant positive impact on board performance through better attendance records and by being more likely to join monitoring committees charged with transparent reporting. Other studies also showed that the presence of women improves both board effectiveness and firm performance (Huse & Solberg, 2006; Campbell & Minguez-Vera, 2008; Kim, Roden & Cox, 2013).

On the other hand, several researchers found no gender differences in ethical judgments among business practitioners (Shafer, Morris, & Ketchand, 2001; Abdolmohammadi, Read & Scarbrough, 2003; Ballantine, 2011).

Financial Pressure or Need

AU-C 240 Appendix A provides examples of fraud risk factors relating to financial pressure or need. These financial motivators include poor financial performance, excessive pressure to meet targets, rapid growth, and significant performance-based compensation.

Poor Financial Performance

Beneish (1997) developed a model to detect earnings management and GAAP violations among firms experiencing extreme financial performance, and found that total accruals, sales growth, and leverage are useful in predicting violators. Skousen, Smith and Wright (2009) found that increased cash needs and external financing are positively related to the likelihood of fraud. Lou and Wang (2009) and Aghghaleh, Iskander, and Mohamed (2014) find leverage positively related to fraud in studies of Taiwanese and Malaysian firms respectively.

Rapid Asset Growth

Rapid growth or unusual profitability can lead to financial pressure. Skousen, Smith and Wright (2009), and Summers and Sweeney (1998) both found that rapid asset growth is positively related to the likelihood of fraud.

Stock Option Compensation

Proponents of stock option compensation argue that it aligns shareholders' and managers' interests, thereby motivating behavior to enhance the firm's stock price. However, a growing body of literature indicates that stock option compensation also encourages earnings management and other fraudulent activities.

Cullinan, et al. (2008) found that companies' independent directors who are compensated with options are more likely to misstate revenues. Archambeault, et al. (2008) also found a positive relationship between stock option compensation for audit committee members and the incidence of financial restatement due to fraud or error. Boumosleh (2009) and Persons (2012)

both found director stock options positively associated with earnings management and concluded that option compensation provides incentives for directors to fail to diligently monitor the financial reporting process.

Rationalization

AU-C 240 Appendix A provides examples of rationalization of fraudulent behavior, including nonfinancial management's participation in selection of accounting principles, aggressive or unrealistic forecasts, and strained relationship with the current or predecessor auditor.

Nonfinancial Management's Participation

Managers are more likely to rationalize that fraudulent acts are justified if financial forecasts are unrealistic or nonfinancial managers are excessively participating in the selection of accounting principles or determining estimates. Skousen and Wright (2008) found that fraud is more likely when the board of directors lacks financial expertise. Kim, Roden and Cox (2013) found that SEC violations are more likely when the board of directors has fewer financial experts.

Board Independence

Prior research documents that a higher proportion of outside directors is associated with a higher quality of reported earnings due to the enhanced independence of boards (Beasley, 1996; Dechow, Sloan & Sweeney, 1996; Klein, 2002; Vafeas, 2005). Outside directors have strong incentives to perform their monitoring duties diligently to protect their reputation in the external directorship markets (Summers & Sweeney, 1998; Beasley & Salterio, 2001). While inside directors provide valuable knowledge about corporate operations to the board discussions, they have incentive to inflate financial performance measures in order to secure their jobs and related compensation. Their insider knowledge and full-time status can potentially transform the board of directors into an instrument of management at the expense of shareholder interests (Williamson, 1984).

Auditor Change

Managers are more likely to rationalize that a fraudulent act is justified if there is a strained relationship with the current or predecessor auditor. Lou and Wang (2009) found auditor change positively related to the likelihood of fraud. Stice (1991) found that the incidence of audit failures and litigation increases immediately after a change in auditor. Kluger and Shields (1989) found that auditor changes before bankruptcy may be partially due to lack of success at suppressing information with the current auditor.

DATA AND MODEL DEVELOPMENT

Sample of Fraud Firms and Matched Control Firms

We formed a sample of firms by reviewing all of the AAERs reported by the SEC from 2003 through 2010. We identified the company name, type of violation, and the relevant years

involved. There were 211 firms with at least one federal securities violation during this post-Sarbanes-Oxley period.

There were five main types of AAER violations in the sample. By far the most common violation was earnings management. Often revenues were inflated or expenses were understated in an effort to meet analysts' estimates. Many cases involved "prematurely recognizing revenue," while others involved complex schemes to "fraudulently inflate reported revenue by creating fictitious customers" or "bogus sales orders and phony revenue." The second most common type of violation was a failure to disclose material information, such as the riskiness of loans or mortgages. Typical AAERs included firms that "failed to disclose related-party transactions" and firms that "deliberately misled investors about significant risks being taken." There were also cases of bribing foreign officials, including reports of "deliveries of cash-filled briefcases to government officials to win sales contracts." There were less frequent incidents of firms backdating stock options. A typical enforcement release described "backdated documents to conceal they were using in-the-money option grants and providing executives with undisclosed compensation." Finally, the fewest number of firms were charged with embezzlement, where managers directly misappropriated funds for their personal benefit. Just over 10% of the firms had multiple violations, typically involving earnings manipulations combined with another infraction. Note that the vast majority of infractions are not embezzlement (typically by one person as studied by Cressey), but are instead frauds conducted at the top corporate level, often in collaboration.

For each sample firm with a securities violation, we searched the SEC EDGAR web site for a proxy statement from the first fraudulent year. If a proxy statement was not available during the first fraudulent year, then the proxy statement from the next available year during the firm's violation period was substituted. There were 67 firms without available proxy statements, typically because they were foreign entities or very small. There were 27 firms without financial data on COMPUSTAT and another 14 firms without a matching control firm (discussed below), resulting in a final sample of 103 fraud firms. The percentages of each type of violation in the final sample are similar to those in the original sample. Table 1 summarizes this information.

Table 1
TYPES OF AAER VIOLATIONS IN THE ORIGINAL AND FINAL SAMPLES

Type of Accounting and Auditing Enforcement Release Violation	Firms in Original Sample	Percentage in Original Sample	Firms in Final Sample	Percentage in Final Sample
Total Number of Fraud Companies	211	100.0	103	100.0
Earnings Manipulation	110	52.1	64	62.1
Failure to Disclose Material Information	50	23.7	11	10.7
Bribing Foreign Officials	30	14.2	14	13.6
Backdating Stock Options	22	10.4	16	15.5
Embezzlement	21	10.0	8	7.8
Firms with Double Violations	22	10.4	10	9.7

Following the methodology of Beasley (1996), we created a control sample of firms without AAER violations designed to match the size and the industry of the fraud firm in the year prior to the first year of the financial statement fraud. A step-wise process was used to identify matching firms by satisfying the following conditions:

1) The firm was not reported in AAER for violating financial reporting regulations from 2003 through 2010.
2) The firm's financial data was available in COMPUSTAT for the year prior to the first year of the fraud firm's violations reported in AAER.
3) The firm was classified in the same four-digit SIC code as the fraud company.
4) The firm's market value of common equity was the closest to that of the given fraud firm among the no-fraud firms satisfying the first three conditions. The size of the matched control firm was required to be within 30% of the size of the fraud firm.
5) If no matching firm was found in condition 4, we modified Condition 3 by using a two-digit SIC code instead of the four-digit code. Conditions 1 through 4 were then repeated with modified Condition 3. This allowed a larger pool by broadening the industry classification.
6) If a matching firm was still not found, we modified Condition 4 by replacing market value of equity with net assets and repeated Conditions 1 through 5. Most cases in this category were due to missing parameters necessary for computing the market value of equity, which made the original Condition 4 infeasible.

Data Collection

Data regarding the board of directors for all firms was collected from the proxy statements, reflecting the characteristics of the violating and matched firms in the year prior to the first violation. Data included the number of board members, their independence, the number of years on the board, gender, financial and accounting expertise, and whether the CEO was also chair. The proxy statements also provided information about the compensation to the firm's senior executives and directors, including whether they received stock options.

Financial information used to construct the matched sample and to calculate financial distress and asset growth was collected from COMPUSTAT from the year preceding the first year of violation. Any data not found on COMPUSTAT was collected from individual financial statements found on the SEC EDGAR site.

Variable Measurements and Predicted Relationships

We select a number of explanatory variables that proxy for fraud risk factors reflected by the fraud triangle components. The model is tested using logistic regressions where the dependent variable equals one if a firm committed an SEC violation and zero if a firm is a matched control. This model is represented by equation 1 below:

$$Fraud\ (0,1) = a + b_i[control\ variables] + c_i[opportunity\ variables] + d_i[pressure\ variables] + f_i[rationalization\ variables] + e_i \quad (1)$$

Opportunity Variables

To measure the impact of a firm combining its top two leadership positions, we created a dummy variable set to one if the chair was also the firm's CEO, and zero otherwise. While there are potential profit motivations for combining these positions, the oversight function of the board may be compromised. Based on the potential conflicts of interest between the two positions, we expect a positive relationship between this dummy variable and the likelihood of fraud.

Tenure is measured as the mean number of years served by the board members at the time of the proxy statement. While experienced directors may gain firm and industry knowledge, seasoned directors may lose their independence over time and favor management's interests over

shareholders'. Therefore, we predict a positive relationship between the average number of years on the board and the likelihood of a violation.

We also measure the percentages of men and women on the board. Women offer diverse experiences that broaden the perspective of the board and help to modify board behavior. The presence of females may also serve as a proxy for open-minded, less entrenched boards of directors. As a result, we expect a positive relationship between the percentage of males and the likelihood of fraud.

Pressure Variables

Altman (1968) developed a widely accepted z-score for measuring financial distress and predicting bankruptcy. We use his revised, more generalized model that is a linear combination of four common business ratios. We predict that this measure of financial distress will be positively related to the incidence of fraud. Since rapid growth can also lead to financial pressure, we measure the percent growth in total assets in the year prior to the fraud. We expect a positive relationship between this measure of growth and fraud.

The literature provides strong evidence that stock option compensation encourages short-term manipulation of earnings and weakens independent oversight. We use a dummy variable equal to one if senior executives and directors are compensated with stock options, and zero otherwise. In all sample firms, stock option compensation was offered to both groups or not offered at all. We expect a positive relationship between stock option compensation and the likelihood of fraud.

Rationalization Variables

Previous research has shown that board member independence is linked to higher quality financial reporting and more effective governance. We measure independence as the percentage of independent board members as declared in the proxy statement and expect to find a positive relationship between the percentage of insiders and the likelihood of fraud. We also measure the percentage of accounting/finance experts on the board and expect a negative relationship with the likelihood of fraud. The Sarbanes-Oxley Act, which requires all audit committee members to be independent and at least one member to be a financial expert, supports the above predictions.

We use a dummy variable equal to one if there was a change in auditor in the two years prior to the first year of fraud, and zero otherwise. Because a change in auditor reflects a likely strained relationship, we predict a positive correlation between a change in auditor and subsequent fraud.

Control Variables

Our model controls for size, leverage, and profitability. Size is measured as the log of total assets expressed in thousands of dollars. Leverage is measured as total debt divided by total assets. Profitability is measured by Return on Assets (ROA) computed as EBIT divided by total assets. Because the control firms are matched to violator firms based on size and industry, which should proxy for profitability and leverage, we do not expect a significant relationship between these variables and the likelihood of fraud.

We were careful to avoid the potential threats to the validity of using non-random matched samples that were identified by Cram, Karan and Stuart (2009). First, as discussed

above, our model includes the appropriate control variables related to the size and industry parameters that we used to create our matched sample. Second, we were careful to minimize imperfect matching by following the process that we described above. Finally, because we are using only logistic regression, concerns about need for reweighting techniques were avoided.

RESULTS

Mean Results

Table 2 shows mean values of selected variables for the samples of fraud and control firms. As expected, control variables are not significantly different between the samples. Debt ratios are relatively high (above 50%) and mean ROA is under 3% for fraud firms and close to zero for the control sample. These results may reflect firms and industries under financial pressure with greater concerns about investor expectations.

Table 2
MEAN RESULTS BY CATEGORY

	Fraud Firms' Mean (n=103)	Control Firms' Mean (n=103)	*t*-value
Control Variables			
Total Assets (000)	$2,405,533	$2,468,393	-0.08
Debt Ratio (Total Liabilities/Total Assets)	52.42%	54.74%	-0.47
Return on Assets (EBIT/Total Assets)	2.75%	-0.01%	0.75
Opportunity Variables			
Average Number of Years on the Board	6.78	5.72	**2.53**
CEOs Also the Chair of the Board	48.54%	34.95%	**1.99**
Men on the Board	93.61%	88.12%	**4.12**
Pressure Variables			
Stock Options Are Paid	79.61%	49.51%	**4.73**
Altman's Z	12.62	13.93	-0.45
One Year Change in Assets	0.82%	0.50%	1.09
Rationalization Variables			
Insider Members on the Board	29.13%	25.03%	**2.94**
Non-Finance/Accounting Experts on the Board	57.11%	54.74%	1.11
Auditor Change	33.01%	16.50%	**2.78**

With regard to the opportunity variables, violator firms have board members with significantly longer tenure, a greater percentage of men on the board, and they are more likely to have the CEO in the position of chair. In fact, the control firms have almost twice as many women directors (11.9% versus 6.4%), and while 49% of violator firms have CEOs that also serve as chair, only 35% of control firms utilize CEOs in that dual role.

In terms of financial pressure variables, the proportion of fraud firms with executive stock option compensation (80%) is higher than the proportion of control firms (50%). There is not a statistically significant difference in the measure of financial distress (Altman's Z) or in asset growth between the two groups.

The variables representing rationalization are all higher in the fraud firms compared to the control firms. The percentage of insiders on the board is significantly higher in the fraud firms and auditor change is more than twice as likely for violator firms.

Logistic Regressions

Table 3 shows the results from five logistic regressions with the dependent variable equal to one if the firm is from the fraud sample and zero if the firm is from the control sample. In the first regression only control variables are included to confirm that the matched control sample is valid. The regression is not significant overall and none of the total variability is explained. As predicted, total assets are not significant because the control firms were matched to the fraud firms based on size. Return on assets and the debt ratio are not significant because the control firms were matched to the fraud firms based on industry.

The second regression includes the control variables and opportunity variables. A significant positive coefficient is found based on the average length of service on the board. This is consistent with entrenched boards being more likely to commit or tolerate fraud. In results not shown in tables, we substituted elected term length in place of average length of service. This variable was not significant indicating that shorter terms may not be effective in reducing entrenchment. A significant positive coefficient is also found on the dummy variable indicating firms where the CEO is also chair, reflecting possible conflicts of interest. When these two positions are combined, fraud is more likely. Finally, a significantly positive coefficient is found on the percentage of men on the board. The presence of women may prevent an otherwise entrenched board from acting unilaterally. This regression based on opportunity has significant explanatory power (pseudo R^2 of 0.13 to 0.18).

The third regression includes control variables and pressure variables. This regression has significant explanatory power (pseudo R^2 of 0.11 to 0.14). The coefficient on the stock option compensation variable is significantly positive. The literature provides strong evidence that stock option compensation encourages short-term manipulation of earnings and weakens independent oversight. However, the coefficient on the variables for financial distress (Altman's Z) and asset growth are not statistically significant. In results not shown in tables, we used market adjusted stock returns as an alternative measure of financial distress, but found no significant relationship to incidents of fraud.

The fourth regression includes the control and rationalization variables. The percentage of insiders has a significantly positive coefficient. The importance of outside directors is well established in the literature. The percentage of finance/accounting experts on the board was not significant. A significantly positive coefficient is found on the dummy variable representing an auditor change within two years of the fraud. Managers are more likely to rationalize that the fraudulent act is justified if there is a strained relationship with their auditor. This regression based on rationalization also has significant explanatory power (pseudo R^2 of 0.08 to 0.10).

The final regression includes control, as well as opportunity, pressure and rationalization variables together. The regression has significant ability to predict fraud firms (pseudo R^2 of 0.25 to 0.33). These results are robust, as all variables that were significant in the previous regressions have the same sign and remain significant with the exception of the number of years on the board, which has the same sign but is no longer significant.

Table 3
LOGISTIC REGRESSIONS USING THE FRAUD TRIANGLE TO EXPLAIN FRAUDULENT BEHAVIOR

	Expected Sign	Control Variables	Opportunity	Pressure	Rationaliza-tion	All Variables
ln (Total Assets)	n/a	0.122	**0.122**	0.072	0.081	**0.222**
		(.119)	**(.090)**	(.336)	(.288)	**(.017)**
Return on Assets	n/a	-0.238	0.056	0.280	0.173	-0.464
		(.694)	(.900)	(.666)	(.776)	(.511)
Debt Ratio	n/a	-0.073	0.118	-0.716	-0.283	-0.298
		(.871)	(.803)	(.229)	(.523)	(.653)
Average Number of Years on Board	+		**0.104**			0.083
			(.056)			(.161)
CEO is Also Chair of Board (0,1)	+		**0.622**			**0.661**
			(.046)			**(.058)**
% of Men on Board	+		**7.559**			**7.102**
			(.000)			**(.001)**
Stock Options Are Paid (0,1)	+			**1.346**		**1.246**
				(.000)		**(.001)**
Altman's Z	+			-0.015		-0.006
				(.212)		(.600)
One Year Percent Change in Assets	+			0.109		0.111
				(.210)		(.268)
% of Insider Members on Board	+				**3.442**	**3.517**
					(.013)	**(.030)**
% of Non-Fin./Acct. Professionals on Board	+				0.714	0.939
					(.469)	(.418)
Auditor Change (0,1)	+				**0.848**	**1.059**
					(.015)	**(.008)**
Constant	n/a	-0.044	**-8.471**	-0.827	**-1.856**	**-10.990**
		(.923)	**(.000)**	(.219)	**(.033)**	**(.000)**
# of Observations		206	206	206	206	206
Chi-squared significance		.799	**.000**	**.001**	**.014**	**.000**
Cox & Snell R^2		.005	.134	.108	.075	.250
Nagelkerke R^2		.007	.178	.144	.100	.334

(Coefficient results for each independent variable are followed by p-values below.)

With regard to opportunity, corporate fraud is more likely with an entrenched board and with the CEO serving as chair. Including more women on the board appears to reduce entrenchment. These results contrast with earlier studies with ambiguous or mixed results with these variables.

With regard to financial pressure, interestingly, we do not find a link between financial performance and fraud. Instead, fraud is more likely at firms that offer senior executives and directors incentive-based compensation, such as stock options. In this sample, it seems that fraud is driven more by greed and the expectation of more compensation rather than the fear of penalties due to poor performance.

With regard to rationalization, fraud is more likely with a higher percentage of insiders and when there was a recent auditor change. Both of these factors allow managers to justify their fraudulent behavior, and these results are consistent with previous literature.

DISCUSSION

We test whether variables that proxy for each element of the fraud triangle are related to fraudulent corporate behavior. Significant explanatory variables are found for opportunity, pressure, and rationalization. We find that SEC violations are more likely with an entrenched board with fewer women, more insiders, and the CEO serving as the chair. Fraud is also more likely when stock option compensation is used and when there has been a recent auditor change.

The fraud triangle results mentioned above are not only statistically significant; they have clear policy implications that could substantially reduce the likelihood of fraud. The coefficients from our logistic regressions can be transformed into an odds ratio by raising the constant *e* to the power of the logistic coefficient.

$$e^{coefficient} = odd\ ratio = Probability(fraud)/Probability(not\ fraud) \qquad (2)$$

This transformation was used in the following discussion of the impact of our explanatory variables. Of course, in the general population of firms the likelihood of fraud is much less than 50%, so the impact of incremental changes will be less dramatic than shown below.

Our regression results show that if the chair was also the firm's CEO, the potential conflicts of interest increased the odds ratio by 93.6%. This means that, in our matched sample, the probability of fraud increases from an initial 50% (half of our sample was fraud firms) to 66.0% when these two positions are combined.

Each percentage change in the proportion of females on the board reduced the odds ratio by eight percent. With the addition of one female on a typical board with ten directors, the enhanced diverse perspectives and reduced entrenchment translates to reducing the probability of fraud from 50% to 30.4%. The presence of a female director appears to have a significant impact on modifying the board's behavior and improving its oversight function.

Assuming a typical board size of ten members, the addition of one more outside director reduced the odds ratio by 48.0%. This enhanced independence translates to reducing the probability of fraud from 50% to 34.2%. Similarly, when stock option compensation was used for senior executives and directors, the probability of fraud increased from 50% to 77.7%. The use of options appears to compromise director independence and impairs their ability to provide objective oversight.

This study suggests clear policies to reduce the likelihood of fraud. Particular attention should be paid to the structure of the board of directors. It is important to have an independent board with regular turnover and gender diversity. The CEO should not be the chairperson. Incentive-based compensation should be avoided or carefully constructed. Long-term stock compensation should be considered as an alternative to options. Finally, conflict with auditors is a warning sign of pending fraud.

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A RISK RETURN PROFILE AND RANKING OF THE DETERMINANTS OF THE ENTERPRISE MULTIPLE

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ABSTRACT

Investors at the margin use, among other data, ratios of valuation to aid in determining the value of firms that they may perceive as potentially good investments. The valuation ratios are also used in identifying "takeover targets" for acquiring firms. Some of the more familiar valuation ratios are the price earnings multiple, the market value to book value ratio, Tobin's Q, and the price earnings growth ratio. If those tools have a common fault, it is that they value a company at one point in time, and their reliability may be questioned when comparing companies with different capital structures, or in different industries. Although the price earnings multiple continues to be the method most used by investors and others, the ratio of enterprise value to earnings before interest, depreciation, taxes, depreciation and amortization has for the past three decades grown in use more extensively. The enterprise value multiple has the advantage of measuring the value of the firm as an on-going entity, and the ability to compare companies with different capital structures. The purpose of this study is to create a financial risk-return profile of those firms with the highest enterprise value multiples, to compare that profile with companies selected at random, and to rank those factors that influence the enterprise multiple. As in previous studies of this nature those factors are analyzed using multiple discriminant analysis, and ranked with canonical correlation.

INTRODUCTION

The market value of all publicly traded firms whether that value is measured by equity prices, price earnings multiples, market capitalization, or the present value of invested capital is established in the marketplace for the most part by the actions of corporate financial managers and the reactions of investors at the margin (those willing and able to buy) who trade off proxies for risk and return to establish market value. There exists many tools, including financial valuation ratios, that are used by investors and acquiring firms to estimate the intrinsic value of firms. Some of the more familiar valuation ratios are the price earnings multiple, the market value to book value ratio, Tobin's Q, and the price earnings growth ratio. If those tools have a common fault, it is that they value a company at one point in time, and their reliability may be questioned when comparing companies with different capital structures, or in different industries. Forbes (2012) offered the opinion that the significance of the enterprise value multiple (EVM) lies in its ability to compare companies with different capital structures, and that by using the EVM instead of market capitalization to look at the value of a company, investors get a more accurate sense of whether or not a company is truly valued. Although the price earnings multiple appears to continue to be the most popular, and most used tool by investors and others for valuation, the EVM has for the past three decades grown in use more extensively (O'Shaughnessy 2011). The EVM has the advantage of measuring the value of the firm as an on-going entity, and the ability to compare companies with different capital structures and in different industries. Zucchi (2013) found that high payout ratios indicate the firm is returning cash to the shareholder in the form of dividends,

rather than re-investing the profits in the company, and that strong yields, determine the return to the shareholder after all the expenses for operating a business and investment in capital expenditures are spent. Accordingly, both high payout ratios and strong yields may have negative consequences. The author concluded that enterprise value per share is the most encompassing and generally considered the most useful in analyzing the current valuation of a stock (Zucchi 2013). However, the denominator in Zucchi's ratio neglected to account for earnings, and like the Zucci study, the O'Shaughnessy that study suffered from the fact that only the numerator in the enterprise value multiple was assessed and earnings were neglected, and the effects of the denominator were not addressed. Thus, companies of different size, different industries, or different capital structures could not be compared.

The enterprise multiple takes into account a company's debt and cash levels in addition to its stock price and relates that value to the firm's cash profitability. It is defined as:

$$\text{Enterprise Value Multiple} = EV / EBITDA \quad (1)$$

If EBITDA is relatively stable, this measurement allows investors to assess a company on the same basis as would an acquirer or other buyer. Thus, the multiple is roughly analogous to the familiar payback period. Regardless of the growing interest and apparent advantages of using the EVM to the estimate intrinsic value of firms, there have been no studies that have determined, or established an association, between the effects of traditional measures of risk and return on the enterprise multiple.

The purpose of this study is to establish a financial profile of those firms identified as having the highest enterprise multiples in the database of over 5000 firms created by (Damodaran 2014) from Bloomberg, Morningstar and Compustat. Specifically, the analysis will test for significant differences in the financial profiles of firms with the highest enterprise multiples and to compare those profiles with companies selected at random. The financial profiles simply consist of common risk-return variables, and two indicators that may reflect how the market views the intrinsic value of the firm, If the two groups of firms have unique financial profiles, and the model can be validated without bias, it suggests that the unique profile may be used as a tool to forecast companies that will maintain high EVM in future periods. The use of such a new tool to forecast higher positions of value would have implications for investors, managers, lenders, investment counselors, and academicians.

METHODOLOGY

The issues to be resolved are first, classification or prediction, and then evaluation of the accuracy of that classification. More specifically, can firms be assigned, on the basis of selected financial variables, to one of two groups: (1) firms that were identified as having the highest enterprise value multiples in their database simply referred to here as Highest Enterprise Value Multiples (HEVM) or, Firms Randomly Chosen (FRC)?

Multiple Discriminant Analysis (MDA) provides a procedure for assigning firms to predetermined groupings based on variables or attributes whose values may depend on the group to which the firm actually belongs, and canonical correlation ranks those variables in order of their weighted effects on the results of the analysis. If the purpose of the study were simply to establish a financial profile of each group of firms, simple ratios would be adequate. However, as early as 1968, in a seminal paper on the use of MDA in finance, Altman showed that sets of variables used in multivariate analysis were better descriptors of the firms, and had more predictive power than individual variables used in univariate tests.

The use of MDA in the social sciences for the purpose of classification is well known. MDA is appropriate when the dependent variables are nominally or ordinally measured and the predictive variables are metrically measured. In addition to its use in the Altman study to predict corporate bankruptcy, other early studies used MDA to predict financially distressed property-liability insurance firms (Trieschmann and Pinches 1973), to determine value (Payne 2010), and the failure of small businesses (Edmister 1982). This study also employs nominally measured dependent variables and metrically measured predictive variables. The nominally measured dependent variables are the group of HEVM firms and the group of FRC firms. The computer program used to perform the analysis is SPSS 19.0 Discriminant Analysis (SPSS Inc. 2010). Since the objective of the analysis is to determine the discriminating capabilities of the entire set of variables without regard to the impact of individual variables, all variables were entered into the model simultaneously. This method is appropriate since the purpose of the study was not to identify the predictive power of any one variable, but instead the predictive power of the entire set of independent variables (Hair, et al. 1992).

SELECTION OF SAMPLE AND INDEPENDENT VARIABLES

Inasmuch as the EVM has the advantage of measuring the value of the firm as an on-going entity, and the ability to compare companies with different capital structures and in different industries, and further, as previously stated, has for the past three decades grown in use more extensively than of other measures (O'Shaughnessy, 2011), it is used here as the subject of study.

All data used in the analysis were gathered from Domodaran's 2014 set. The sample selected for this study consists of two groups. The HEVM group contains 2143 observations and the FRC group has 288 observations. The sample is so large that as long as the variance covariance matrices are equal, it renders the size of the groups insignificant, and of course, the use of that much data exhausted Domodaran's database. The first group was identified by Damodaran as the group in that database having the highest EVM. The second group was randomly selected from the remaining firms in that database.

Previous studies using this and other statistical methods have chosen explanatory variables by various methods and logical arguments. In this study the group of explanatory variables chosen for analysis includes two measures of return on investment, two measures of risk, one measure of how the firm may be investing for the future, and finally one measure of how the company may be perceived by investors at the margin. It is the buying and selling of those investors that establish the market value of both equity and debt. An evaluation of those measures is needed to accomplish the purpose of this study. A basic tenet of this study is that all investors "trade off" indicators of risk and return to establish the value of the firms. Following are the seven explanatory variables:

X_1 *One measure of return is return to total capital. Return to total capital includes a return to creditors as well as owners, and recognizes that value is affected by the cost of debt. A measure of return to equity could be used, but it would ignore the cost of debt and the fact that debt as well as equity is used to finance assets. This is consistent with the use of the debt to total capital ratio as a measure of financial leverage.*

X_2 *Growth may also be regarded as a return on capital, and indeed growth has been of interest to financial investors for years. In this study Damodaran's five-year change in sales was used. Changes in revenue, cash flow, earnings and dividends are also given, but those variables are a long-term function of sales.*

X_3 *There is in any company both financial risk (financial leverage) and operating risk (operating leverage). Sharpe's beta coefficients contain the effects of both operating and financial risk. It is customary in modern research to separate the two types of risk to identify and compare the sources of risk. The separation is accomplished by using Hamada's (1972) equation to "unlever" the published betas. "The unlevered beta*

resulting from Hamada's equation is used as a measure of operating or business risk that results from fixed operating costs.

X_4 *Long Term Debt to Total Capital (DTC) is used here as a measure of financial risk (financial leverage). There are other ratios that measure financial risk very well, but the long-term debt to total capital ratio again recognizes that the firm is financed by creditors as well as owners.*

X_5 *The fifth explanatory variable is Capital Spending Per Share. The data gathered from this study were gathered from the year 2014, the fifth year of economic recovery from the economic downturn of 2008. It is expected that in periods of economic recover all firms would increase capital expenditures. It will be informative to determine whether or not firms that have created high enterprise value multiples have increased their capital spending beyond that of firms selected randomly. It has been said that while the price earnings multiple is a rough measure of the value as a function of past earnings, the capital spending to earnings ratio may be regarded as an indicator of future value (Payne 2010).*

X_6 *The activity of institutional investors has long been a favored topic in financial literature. The daily trading of such investors varies between 50 and 70 percent of all daily trading on the New York Stock Exchange (Brancato and Rabimov 2007). We include the buying activity of institutional investors simply as an indicator of how the market or at least a significant.*

In sum, there are six explanatory variables in the multiple discriminant model. They are as follows:

X1 - Return on Total Capital
X2 - The Five Year Growth Rate
X3 - Hamada's Unlevered Beta (Operating Risk)
X4 - Long Term Debt to Total Capital (Financial Risk)
X5 - Capital Spending Per Share
X6 - Institutional Investor Buying Activity

The explanatory variable profile contains basic measures of common financial variables. They were chosen, as in any experimental design, because of their consistency with theory, adequacy in measurement, the extent to which they have been used in previous studies, and their availability from a reputable source. Other explanatory variables such as the dividend payout ratio and free cash flows could have been added, however their contributions to the accomplishment of the stated purpose of the study would have been negligible. When there are a large number of potential independent variables that can be used, the general approach is to use the fewest number of independent variables that accounts for a sufficiently large portion of the discrimination procedure (Zaiontz 2014). The more accepted practice is to use only the variables that logically contribute the accomplishment of the study's purpose (Suozzo 2001). This study is consistent with both references.

TESTS AND RESULTS

The discriminant function used has the form:

$$Z_j = V_1X_{1j}+V_2X_{2j}+\ldots\ldots+V_nX_{nj} \quad (4)$$

Where:
X_{ij} is the firm's value for the ith independent variable.
V_i is the discriminant coefficient for the firm's jith variable.
Z_j is the jth individual's discriminant score.

The function derived from the data in this study and substituted in equation 1 is:

$$Z_j = -3.874 - .001X_1 + .784X_2 + 3.783X_3 - .631X_4 + .000X_5 + 1.156X_6 \quad (5)$$

Classification of firms is relatively simple. The values of the seven variables for each firm are substituted into equation (5). Thus, each firm in both groups receives a Z score. If a firm's Z score is greater than a critical value, the firm is classified in group one (HEVM). Conversely, a Z score less than the critical value will place the firm in group two (FRC). Since the two groups are heterogeneous, the expectation is that HEVM firms will fall into one group and the FRC firms will fall into the other. Interpretation of the results of discriminant analysis is usually accomplished by addressing four basic questions:

1. Is there a significant difference between the mean vectors of explanatory variables for the two groups of firms?
2. How well did the discriminant function perform?
3. How well did the independent variables perform?
4. Will this function discriminate as well on any random sample of firms as it did on the original sample?

To answer the first question, SPSS provides a Wilk's Lamda – Chi Square transformation (Sharma 1996). The calculated value of Chi-Square is 830.66. That far exceeds the critical value of Chi-Square 12.592 at the five percent level of significance with 6 degrees of freedom. The null hypothesis that there is no significant difference between the financial profiles of the two groups is therefore rejected, and the first conclusion drawn from the analysis is that the two groups have significantly different financial characteristics. This result was of course, expected since one group of firms experienced very high enterprise value multiples and the other group was chosen randomly. The discriminant function thus has the power to separate the two groups. However, this does not mean that it will in fact separate them. The ultimate value of a discriminant model depends on the results obtained. That is what percentage of firms was classified correctly and is that percentage significant?

To answer the second question a test of proportions is needed. Of the 2143 firms in the HEVM group, 1800 were classified correctly. Of the 288 firms in the FRC group, 242 were classified correctly. That is, 2042 of the total of 2431 in the total sample or 84.0 percent were classified correctly. The results are shown in Table 1.

Table 1
CLASSIFICATION RESULTS
Predicted Results

HEVM - FRC Classification

Actual Results	HEVM	FRC
HEVM	1800	343
FRC	46	242

Of course, it is obvious that 84 percent is significant, but formal research requires the proof of a statistical test. To test whether or not an 84 percent correct classification rate is statistically significant, the Press's Q test is appropriate (Hair et al. 1992). Press's Q is a Chi-square random variable:

$$\text{Press's } Q = [N-(n \times k)]^2 / N(k-1) \quad (6)$$

where:

N = Total sample size
n = Number of cases correctly classified
k = Number of groups

In this case:

$$\text{Press's } Q = [2431 - (2042 \times 2)]^2 / [2431\ (2-1)] = 6859 > \chi^2_{.05}\ 3.84 \text{ with one d. f.} \quad (7)$$

Thus, the null hypothesis that the percentage classified correctly is not significantly different from what would be classified correctly by chance is rejected. The evidence suggests that the discriminant function performed very well in separating the two groups. Again, given the disparity of the two groups, and the sample size, it is not surprising that the function classified 84 percent correctly.

The arithmetic signs of the adjusted coefficients in Table 2 are important to answer question number three. Normally, a positive sign indicates that the greater a firm's value for the variable, the more likely it will be in group one, the HEVM group. On the other hand, a negative sign for an adjusted coefficient signifies that the greater a firm's value for that variable, the more likely it will be classified in group two, the FRC group. Thus, according to Table 2, the greater the following variables: The five year growth rate, capital expenditures per share, and institutional investor buying activity, the more likely the firm would have achieved a high EV/CSO ratio. Conversely, the greater the levels of both operating leverage and financial leverage, the return on invested capital, and the price – earnings - growth ratio, the less likely the firm would have achieved high EV/CSO levels.

The relative contribution of each variable to the total discriminating power of the function is indicated by the discriminant loadings, referred to by SPSS as the pooled within-groups correlations between discriminating variables and canonical function coefficients, or more simply their structure matrix. Those structure correlations are indicated by canonical correlation coefficients that measure the simple correlation between each independent variable and the Z scores calculated by the discriminant function. The value of each canonical coefficient will lie between +1 and -1. Multicollinearity has little effect on the stability of canonical correlation coefficients, in contrast to the discriminant function coefficients where it can cause the measures to become unstable. (Sharma 1996). The closer the absolute value of the loading to 1, the stronger the relationship between the discriminating variable and the discriminant function These discriminant loadings are given in the output of the SPSS 19.0 program, and shown here with their ranking in Table 2.

Table 2
RELATIVE CONTRIBUTION OF THE VARIABLES

Discriminant Variables	Coefficient	Rank
Hamada's Unlevered Beta (Operating Risk)	.952	1
Long Term Debt to Total Capital (Financial Risk	-.443	2
Institutional Buying Activity	.311	3
The Five Year Growth Rate	.195	4
Capital Spending Per Share	-.139	5
Return on Total Capital	-.002	6

Table 2 reveals that the measure of operating risk (leverage) made the greatest contribution to the overall discriminating function. It is followed respectively by the measure of financial risk (leverage), institutional investors buying activity, growth, capital spending, and finally return to total capital.

Some multicollinearity may exist between the predictive variables in the discriminant function, since both return and risk could be reflected in the institutional investors buying activity. Hair, et al. (1992) wrote that this consideration becomes critical in stepwise analysis and may be the factor determining whether a variable should be entered into a model. However, when all variables are entered into the model simultaneously, the discriminatory power of the model is a function of the variables evaluated as a set and multicollinearity becomes less important. More importantly, the rankings of explanatory variables in this study were made by the canonical correlation coefficients shown in Table 2. As discussed the previous paragraph, those coefficients are unaffected by multicollinearity (Sharma, 1996).

VALIDATION OF THE MODEL

Before any general conclusions can be drawn, a determination must be made on whether the model will yield valid results for any group of randomly drawn firms. The procedure used here for validation is referred to as the Lachenbruch or, more informally, the "jackknife" method. In this method, the discriminant function is fitted to repeatedly drawn samples of the original sample. The procedure estimates (k – 1) samples, and eliminates one case at a time from the original sample of "k" cases (Hair et al. 1992). The expectation is that the proportion of firms classified correctly by the jackknife method would be less than that in the original sample due to the systematic bias associated with sampling errors. In this study there was a difference of only two firms. At first glance a reader might conclude that it is unusual to complete an analysis of this size and have a difference of only two firms between the two groups. However, with a very large sample such as the 2431 companies used in this study, the differences seem to diminish. The major issue is whether the proportion classified correctly by the validation test differs significantly from the 84 percent classified correctly in the original test. That is, is the difference in the two proportions classified correctly by the two tests due to bias, and if so is that bias significant? Of course, it may be obvious that a difference of only two cases will not be significant with a sample of 2431 companies. However, as in the aforementioned case of the Press's Q test of proportions, formal research requires the proof of a statistical test. The jackknife validation resulted in the correct classification of 83.9 percent of the firms. Since there are only two samples for analysis the binomial test is appropriate:

$$t = r - n\ p\ /\ [n\ p\ q]^{1/2} \quad (8)$$

Where:

t is the calculated t statistic
r is the number of cases classified correctly in the validation test.
n is the sample size.
p is the probability of a company being classified correctly in the original test.
q is the probability that a firm would be misclassified in the original test.

In this case: $2040 - 2431\ (.84)\ /\ [2431\ (.80)\ (.20)]^{½} = -.111$ is less than t_{05} 1.645. (9)

Thus, the null hypothesis that there is no significant difference between the proportion of firms classified correctly in the original test and the proportion classified correctly in the validation test cannot be rejected. Therefore, it can be concluded that while there may be some bias in the original analysis, it is not significant and it is concluded that the procedure will classify new firms as well as it did in the original analysis.

In addition to the validation procedure, researchers usually address the question of the equality of matrices. This is especially important in studies such as this where there is disparity in the size of the groups. One of the assumptions in using MDA is that the variance-covariance matrices of the two groups are equal. The SPSS program tests for equality of matrices by means of Box's M statistic. In this study Box's M transformed to the more familiar F statistic of 256.03 resulted in a zero level of significance. Thus, the null hypothesis that the two matrices are equal cannot be rejected.

SUMMARY AND CONCLUSIONS

The purpose of this study was to establish a financial profile of those firms identified as having the highest enterprise multiples in the database of over 5000 firms created by (Damodaran 2014). Specifically, the analysis tested for significant differences in the financial profiles of firms with the highest enterprise multiples and to compare those profiles with companies selected at random. The financial profiles simply consist of common risk-return variables, a measure of how the firm may be investing for the future, and finally one measure of how the company may be perceived by investors at the margin. A unique set of explanatory variables was found for those firms with high enterprise value multiples, and since the model was validated without bias, it is suggested that the profile may be used to identify firms that will maintain those high multiples in the future.

The results of the statistical analysis indicated first, that there was a significant difference in the financial profiles of the two groups of firms. The fact that the discriminant function separated two heterogeneous groups, and classified a significant proportion correctly is no surprise. In fact, the two groups of firms were so diverse in the matter of achieving high multiples that it would certainly have been a surprise if the discriminant function had not been so efficient.

Table 2 reveals that the measure of operating risk (leverage) made the greatest contribution to the overall discriminating function. It is followed respectively by the measure of financial risk (leverage), institutional investors buying activity, growth, capital spending, and finally return to total capital. The greater the values for operating leverage, institutional buying activity, and sustained growth, the more likely the firm has a high enterprise value multiple. Conversely, the greater the

values for financial leverage, capital spending, and return to total capital, the less likely the firm would have a high enterprise value multiple.

Four of these of these results may have been expected, one had no apriori expectation and, one was simply a surprise. Explanations as to why the variables are associated with one group or the other are beyond the scope of this study. However, a few comments on the findings may be in order.

It was expected that since high growth rates, and heavy institutional investor buying add to market capitalization and since market capitalization is normally the largest factor in the numerator of the enterprise value multiple, then the high growth rates and heavy institutional buying would be associated with the firms with higher multiples. It also may have been expected that a high level of operating leverage would be associated with high multiples. The larger the factors in the numerator, the larger will be the company in size. Large companies have greater fixed operating cost and thus, higher operating leverage. The exceptional factor in the numerator is of course cash. However, the cash balance is normally relatively small compared to market capitalization, debt, and preferred stock. Further, it may have been expected that capital spending was not associated with high enterprise multiples. Capital spending is a factor in the denominator of the enterprise value multiple and thus, the higher the level of capital spending, the lower will be the multiple. There were no aprori expectations for the ratio of debt to total capital (financial leverage). It was simply not known. The higher the level of debt, the higher will be the enterprise value multiple, but in this study the debt to total capital ratio instead of total debt was used to compute financial leverage.

The study resulted in one surprise. The return on total on total assets variable was not characteristic of firms that achieved high levels of enterprise value. This finding is consistent with previous research. As stated earlier however that study did not include earnings. Value is established in the market place where return on invested capital is a highly regarded characteristic of any firm. No explanation of this empirical result can be offered here, and it may indeed defy logic. However, that finding as well as the other conclusions of the study is rich in content for needed further research.

This study has resulted in a contribution toward the construction of a theory that describes the risk-return and market perception characteristics of firms that have achieved the highest enterprise value multiples. It is further suggested that since the model was validated without bias, it can be used to predict firms that may again achieve high of enterprise value multiples in the future. In order to make a more complete contribution to the theory, the aforementioned further research is needed. The construction of a complete theory would aid managers, investors, academicians, and investment counselors by providing greater of knowledge on which to base financial decisions.

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ANALYZING COST BEHAVIOR OF PHILIPPINE INDUSTRIAL FIRMS

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ABSTRACT

Recent studies find that cost behave asymmetrically with changes in activity levels which challenges the traditional view that cost behaves either symmetrically with volume (variable) or remains the same (fixed). Philippine industrial firms exhibit this cost behavior using discretionary costs such as sales, general and administrative expenses (SGA). However, the question remains whether they exhibit the same behavior for other types of costs such as cost of goods sold, investment costs and total operating costs. This study shows that Philippine industrial firms adjust their cost structures whether it be their cost of goods sold, investment costs or total operaring costs with changes in demand conditions using the empirical model of ABJ (2003).

Key Words: *Sticky costs, cost behavior, asymmetric cost behaviour*

INTRODUCTION

The path to achieving sustainable competitiveness advantage has not been easy for firms. With fiercer and more global competition, companies have embarked on a journey to constantly and continuously re-engineer and innovate their products, processes and systems in order to stay ahead. In monitoring their progress as a result of these operational and strategic adjustments, firms use performance frameworks such as the Balanced Scorecard. Through the use of such multi-dimensional scorecards, firms realize the importance of strategic dimensions of traditional accounting and financial constructs such as cost. Therefore, studies on how different cost behave are more valuable during these times.

COST BEHAVIOR

Cost behavior has been widely studied in literature and normally associated it with respect to volume. Most management and cost accounting textbooks would describe and view cost behaving either as variable or fixed, the former changing proportionally to changes in business activity level. It is generally assumed that variable costs change proportionately with changes in activity drivers (Noreen, 1991). Fixed costs, on the other hand, remain invariable in the short-run but are also related with activity in the long term.

This traditional cost behavior models assume that the direction of change is symmetrical during both economic downturns (i.e. period of economic crisis, cost reduction programs) and upturns (i.e. period of economic growth, expansion). This implies that the magnitude of change of costs depends only on the extent of a change in level of activity, and not on the direction of change. However, this assumption has been challenged in recent studies by Cooper and Kaplan (1998) and Noreen and Soderstrom (1994 and 1997). They posit that overhead costs rise more with increases in activity volume than they fall with decreases. Anderson, Banker and Janakiraman (2003), or ABJ, found evidence that discretionary costs (i.e. sales, general, and administrative or SG&A) do not behave symmetrically with activity, which implies that the

magnitude of the increase in costs associated with an increase in activity driver or volume is greater than the magnitude of the decrease in costs associated with an equivalent decrease in volume.

The introduction of the ABC concept led to more studies about cost behavior. Recent management accounting literature has argued that the ABC model of cost behavior is inconsistent with the way managers actually make decisions and manages costs. Cooper and Kaplan (1998), and Noreen and Soderstrom (1997) posit that overhead costs raise more with increases in activity volume than they fall with decreases. A central component of cost management is the manager's response to exogenous shocks to output demand. Exogenous shocks are hypothesized to cause managers to revisit the relationship between activity and input levels, and between revenues and costs, and to evaluate costly adjustments as compared to the status quo. Adjustment costs are typically ignored in traditional cost accounting. Cooper and Kaplan (1998) further argued that cost management renders the traditional model of fixed and variable cost behavior obsolete.

Traditionally, cost behavior is based on a microeconomic distinction of costs as fixed versus variable with respect to activity volume. In this setting, the total variable costs' behavior is contemporaneous, linear and symmetric to sales volume movements. The magnitude of changes of variable costs is independent of activity volume of prior periods. Managers, in this environment, do not play an explicit role in how cost behaves.

The ABJ study in 2003 presented an alternative pattern of asymmetrical behavior of costs with respect to its upward versus downward activity driver. This phenomenon is popularly called cost stickiness and the cost behavior, sticky costs.

STICKY COSTS

Sticky costs occur because there are asymmetric frictions in making resource adjustments attributed to deliberate managerial action in response to different factors such as demand condition changes, hiring practices and even managerial empire-building tendencies. There are forces acting to restrain or slow the downward adjustment process more than the upward adjustment process. Thus, cost stickiness is more consistent with this cost behavior model.

In other words, when volume falls, managers are expected to decide whether to maintain committed resources and bear the cost of operating excess capacity or reduce committed resources and incur adjustment costs of retrenching. They claim that cost stickiness occurs because managers do not make decisions to remove resources that are not utilized when activity level falls. Increasing quality of decision-making would likely reduce the level of stickiness. Better information would entail optimal decisions, while the lack or poor quality of information would not allow appropriate ones. On the other hand, when activity increases, uninformed decisions would instigate less-adjusted investment decisions. When activity decreases, well-informed decisions would likely allow faster and better-fitted resource adjustments.

The question of whether the traditional model of fixed and variable (with volume) cost is a sufficiently accurate representation of production economics as a basis for management decisions has led to an increased interest in the sticky cost behavior. (Cooper and Kaplan, 1998).

In 1997, Noreen and Soderstrom tested the predictive accuracy of the traditional cost model, they documented a curious pattern – some cost accounts exhibited a lower response to volume decreases than to volume increases. This discovery was consistent with assertions in the ABC literature about how managers adjust costly resources in response to exogenous demand shifts (Cooper and Kaplan, 1998). This led the study of ABJ (2003) to argue that if managers

deliberately adjust resources committed to activities, then the direction of volume changes will affect actual costs and the traditional model of fixed and variable costs do not hold. Their empirical test contrasts the two models of cost behavior. While efficient production specifies that the optimal combination of inputs for a given level of output, several factors may intervene to preclude or limit resource adjustments. These factors are hypothesized to lead to "sticky" cost behavior in which cost adjust asymmetrically; more quickly for upward than for downward demand shifts.

ABJ (2003) reiterates that this model likewise distinguishes between costs that move mechanically with changes in volume and those that are determined by the resources committed by managers. When volume falls, managers must decide whether to maintain committed resources and bear the costs of operating with utilized capacity or reduce committed resources and incur adjustment costs of retrenching and if volume is restored, replacing committed resources at a later date.

Calleja, et al. (2006) extended ABJ's (2003) study by comparing cost behavior of publicly listed firms in the UK, US, France and Germany. Their study showed that costs are sticky across all firms and countries. However, French and German firms exhibit higher level of stickiness attributing it to the different governance systems in their respective countries. De Madeiros and Costa (2004) used Brazilian firms as samples and found that cost stickiness is "significantly more intense than in American firms". They ascribe this to the less stable economy of Brazil claiming that because of this, managers find it difficult to predict if the decrease in revenues is permanent or only temporary. Using Philippine firms as samples, Uy (2014) found that cost stickiness is also prevalent. This may be an indicator that economic and legal structure as well as cultural factors influences adjustment costs and cost stickiness.

In another study, Balakrishnan and Gruca (2008) examined the relationship between cost stickiness and a firm's core competency. Instead of using a firm level data, they used data from different departments within hospitals. Their study concluded that cost at the firm level generally exhibits stickiness which is consistent with ABJ's (2003) study. However, within the firm, costs that relate to core activities (e.g. direct patient care) are relatively stickier compared to support activities. This implies that costs connected to core competency are likely to exhibit higher degree of stickiness.

The industry effect on cost stickiness was made by Subramaniam and Weidenmier (2003). In their study, manufacturing firms exhibited the highest level of stickiness, while merchandising firms the lowest.

Chen, Lu and Sougiannis (2012) provided arguments that cost stickiness is directly related to a manager's empire-building incentives and is negatively related to corporate governance. This is more evident among firms that are more vulnerable to managerial empire-building.

Moreover, Weiss (2010) and Homburg and Nasev (2008) claim that cost stickiness does not only affect effective cost management but is costly for firms because of its impact on earnings and profit asymmetric timeliness. Cost stickiness is associated with cash flow uncertainty which they claim impact the conditional conservatism of firms. This implies that earnings are less timely when the magnitude of cost stickiness is higher. Thus, managers see this information asymmetry between them and the external users as an incentive to overstate financial performance since future positive net present values are unverifiable. This provides justification to why conditional conservatism distinguishes efficient from inefficient cost sticky firms should offset the incentive by limiting management's discretion. Efficient cost sticky firms

are characterized by declining current sales and rebounding expected sales while inefficient cost sticky firms are projected to have a permanent decline in sales. Interestingly, Weiss (2010) also found that cost stickiness leads to an average of 25% poorer earnings forecast than firms with anti-sticky cost behavior.

ABJ's (2003) cost stickiness model is not without critic. Anderson and Lanen (2007 and 2009) challenged their conclusions. They raised the possibility that this phenomenon may be produced by a "mechanical" cost relation associated with technical and engineering production specifications. Balakrishnan and Gruca (2008) attempted to address this critique by examining situations with predictable variations in cost stickiness due to expected variations in adjustment costs. They concluded that overall evidence from archival data is not robust. This suggests that "we need finer tests to gain more insights into how managerial incentives affect cost management".

It is then very evident that knowing how costs behave provides insight to how firms behave in general and managers construct the firm's resource infrastructure in particular.

FRAMEWORK AND EMPIRICAL MODEL

Theoretical Framework

The concept of cost stickiness was inspired by the economics' price stickiness model which describes that firms do not immediately change their prices to adjust to changes in demand. In the same manner, sales revenues and operating costs do not move proportionately because managers do not immediately change committed resources particularly when demand shifts.

According to the deliberate decision theory (Yusukata and Kajiwara, 2009), cost stickiness occurs because managers do not make decisions to remove resources that are not utilized when activity level falls. Increasing quality of decision-making would likely reduce the level of stickiness. Better information would entail optimal decisions, while the lack or poor quality of information would not allow appropriate ones. On the other hand, when activity increases, uninformed decisions would instigate less-adjusted investment decisions. When activity decreases, well-informed decisions would likely allow faster and better-fitted resource adjustments.

The cost adjustment delay theory articulates that costs become sticky as a result of cost adjustments being unable to keep up with the speed of sales decline (Yusukata and Kajiwara, 2009).

Operational Framework

Traditional model of cost behavior recognizes that sales activities affect costs. In particular, variable costs move proportionately with changes in sales activity. The traditional model of costs views changes in variable costs as strictly proportional to changes in sales activity. For instance, a 1% increase in sales activity increases costs also by 1% and vice versa. Hence, this study will also use the same relationship between costs and activities (i.e. change in SG&A costs is a function of changes in sales activity). In equation form,

$$\Delta \text{ SG\&A Costs} = f(\Delta \text{Sales Activity}) \quad (1)$$

However, as ABJ (2003) found empirical support that costs increase more in response to activity increases than they decrease in response to activity decreases, this equation will be modified to take into account the direction of the changes which the traditional cost behavior model does not consider.

Empirical Model

To test the sticky cost hypothesis, this study used a log-log model derived from the cost function based on the Cobb-Douglas production function. The empirical model is derived by Uy (2011) is presented in Equation (2).

$$\log\left(\frac{c_t}{c_{t-1}}\right) = \gamma_0 + \gamma_1 \log\left(\frac{y_t}{y_{t-1}}\right) + \gamma_2 D_t \log\left(\frac{y_t}{y_{t-1}}\right) + \varepsilon_t \quad (2)$$

where D_t=1 if $\Delta y_{i,t}$<0 and D_t=0 if $\Delta y_{i,t}$>0

Equation (3) presents the empirical model using the measurement choices of ABJ and relevant cost proxies.

$$\log\left(\frac{Cost_t}{Cost_{t-1}}\right) = \beta_0 + \beta_1 \log\left(\frac{Rev_t}{Rev_{t-1}}\right) + \beta_2 D_t \log\left(\frac{Rev_t}{Rev_{t-1}}\right) + \varepsilon_{i,t} \quad (3)$$

where D_t=1 if $\Delta Rev_{i,t}$<0 and D_t=0 if $\Delta Rev_{i,t}$>0

This empirical model examined the response of the various costs at time t to a same period change in sales revenues. It used ratio and log forms to improve variable comparability and to minimize the heteroskedasticity problem resulting from large variations in firm sizes.

This log-log model interpreted the estimated coefficients using percentage. In this basic model, when D_t is zero, implying a positive change between two periods, the parameter β_1 would indicate the percentage change in SG&A expenditures when sales revenue increases by one percent. On the other hand, if the change is negative, D_t has a value of one and the percentage change in SG&A costs with a one percent decrease in sales revenue is captured by the sum of β_1 and β_2. Moreover, β_1 and β_2 are expected to have positive and negative values respectively. If the value of β_2 is zero, then cost stickiness is non-evident because the magnitudes of SG&A costs' increase and decrease are the same ($\beta_{1=}$ β_{1+} β_2). On the other hand, if β_2< 0, then the degree of increase in SG&A due to an increase in sales level is greater than the degree of decrease due to a decrease in sales activities ($\beta_{1>}$ β_{1+} β_2), signifying the presence of costs' sticky behavior.

In summary, the coefficient β_1 measures the percentage increase in SG&A costs with a 1% increase in sales, while the combined coefficients, β_{1+} β_2 measures the percentage decrease in SG&A costs with a 1% decrease in sales. In the traditional fixed- and variable-cost model, it proposes that total cost changes are invariant to the direction of the change in activity, which means that $\beta_{2=}0$.

PROBLEM STATEMENT AND HYPOTHESES

In a previous study (Uy, 2014), it was shown that Philippine industrial firms exhibit cost stickiness when discretionary costs (i.e. SG&A) was used. this study aims to extend the analysis of cost behavior exhibited by Philippine industrial firms in adjusting for demand condition changes using other types of costs – cost of goods sold, investment costs (or capital expenditures), and operating costs (or operating expenditures).

We test for sticky cost behavior by comparing the variation of cost of goods sold, operating costs and investment costs with sales revenue in periods when revenue increases with the variation of such costs with sales revenue in periods when revenue decreases.

H_1: *The relative magnitude of an increase in cost of good sold for an increase in sales revenue is greater than the relative magnitude of a decrease in cost of goods sold for a decrease in sales revenue.*

H_2: *The relative magnitude of an increase in total operating costs an increase in sales revenue is greater than the relative magnitude of a decrease in total operating costs for a decrease in sales revenue.*

H_3: *The relative magnitude of an increase in investment costs for an increase in sales revenue is greater than the relative magnitude of a decrease in investment costs for a decrease in sales revenue.*

SCOPE AND LIMITATION

The study is limited to the testing of the cost stickiness empirical model using selected Philippines industrial firms listed in the Philippine Stock Exchange (PSE) for the period 2000-2012. The study is likewise limited to the examination of the relationship of the movement of sales as proxy for output or activity level, and the different costs presented in the financial statements of the respective company and not the total economic cost of the firm. Furthermore, the study did not attempt to take into account the specific agreements and contracts entered by firms but rather it considered the collective effects of these agreements and contracts as reported in their respective financial statements.

METHODOLOGY

A traditional panel analysis was utilized to determine the cost stickiness of firms in the Philippines. The advantages of conducting a panel analysis include an increased sample size, the ability to study repeated cross-section observations, and more complicated behavioral models (Gujarati, 2003). By combining time series and cross-section data, panel data gives us more informative data, more variability, less collinearity among variables, more degrees of freedom, and more efficiency. Heterogeneity will be taken into account by allowing for individual-specific variables.

A panel regression has different variation examples, which include the Fixed Effects Model (FEM) and Random Effects Model (REM). Before estimating the FEM, a simple OLS regression of the naïve or pooled model will be estimated.

Fixed Effects (FE) models are designed to isolate the individual impacts of an entity or individual on the regressand. FE estimation explores the relationship between the dependent and independent variables within an entity (country, person, or company). Each entity has its own individual characteristics that may or may not influence the dependent variable. When using FE estimation, we assume that something within the entity may impact the dependent or independent variables and we need to control for this. This is the rationale behind the assumption of the correlation between the entity's error term and the independent variables. FE estimation removes the effect of those time-invariant characteristics from the independent variables so we can assess the independent variables' net effect. Another important assumption of the FE model is that those time-invariant characteristics are unique to the individual and should not be correlated with other individual characteristics. Each entity is different; thus, the entity's error term and the constant (which captures individual characteristics) should not be correlated with the others. If the unobserved variables or individual characteristics do not change over time, then any changes in the dependent variable must be due to influences other than these fixed characteristics.

On the other hand, unlike FEM, the variation across entities of a REM is assumed to be random and uncorrelated with the independent variables included in the model. It allows us to check if the differences across entities have some influence on the dependent variable, and it assumes that the entity's error term is not correlated with the independent variables. This allows for time-invariant variables to play a role as explanatory variables.

The Hausman test was used to determine the most appropriate panel data model (the FEM or the REM) to use. This test determines whether or not the unmeasured factors are correlated with the regressors. If the test statistic is less than 0.05, the null hypothesis will be rejected. This means that the unique errors are correlated; therefore, the appropriate model to be used is the fixed effect model. On the other hand, if the test statistic is greater than 0.05, there is not enough reason to reject the null hypothesis. This means the unique errors are not correlated; thus, making the appropriate model to be used is the random effects model.

RESULTS AND DISCUSSION

Descriptive Statistics

The dataset used in the study was constructed using the Osiris database. For the period 2000-2012, the study selected 76 firms and 912 firm-years. Table 1 shows the description of the sample firms used in the study.

Table 1
DESCRIPTIVE STATISTICS
All reported numbers are in PhP'000,000 except the percentages

(PhP'000,000)	Mean	Standard Deviation	Median	% of firm-years with negative % change
Sales revenues	14,646.56	41,361.63	1,871.14	32.53%
Cost of goods sold	9,281.12	32,456.34	1,146.45	33.04%
Operating costs	3,512.73	11,555.37	348.45	33.77%
Investing costs	(1,694.01)	8,037.03	(103.42)	59.61

No. of firms	76
No. of firm-years	912

Estimation Results

The results of the Hausman tests show that the fixed effect model is the preferred model for testing the stickiness of cost of goods sold (H_1) and total operating costs (H_2) while the random effects model for investment costs (H_3).

Figure 1
HAUSMAN TEST (COST OF GOODS SOLD)

```
                 ---- Coefficients ----
             |      (b)        (B)          (b-B)     sqrt(diag(V_b-V_B))
             |     fixed      random       Difference       S.E.
-------------+------------------------------------------------------------
    logdrev  |    .4177622    .4214061      -.0036439       .0148473
   dlogdrev  |   -.4030661   -.3305645      -.0725016       .0276281
------------------------------------------------------------------------------
 b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg
Test:  Ho:  difference in coefficients not systematic
                chi2(2) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                        =      88.56
              Prob>chi2 =      0.0000
```

Since the Prob>chi2 is 0.00, there is enough reason to reject the null hypothesis. Therefore, the fixed effects model will be used for cost of goods sold.

Figure 2
HAUSMAN TEST (OPERATING COSTS)

```
              ---- Coefficients ----
             | (b) (B) (b-B) sqrt(diag(V_b-V_B))
             | fixed random Difference S.E.
-------------+----------------------------------------------------------
     logdrev | .2641804 .2674817 -.0033013 .0181215
    dlogdrev | -.2062148 -.161944 -.0442708 .0315588
------------------------------------------------------------------------
b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg
Test: Ho: difference in coefficients not systematic
                    chi2(2) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                            = 15.71
                  Prob>chi2 = 0.0004
```

Since the Prob>chi2 is 0.0004, there is enough reason to reject the null hypothesis. Therefore, the fixed effects model will be used for operating expense.

Figure 3
HAUSMAN TEST (INVESTING COSTS)

```
                 ---- Coefficients ----
              | (b) (B) (b-B) sqrt(diag(V_b-V_B))
              | fixed random Difference S.E.
-------------+------------------------------------------------------------
     logdrev | .0609202 .0663029 -.0053827 .1181668
    dlogdrev | .082159 .0454897 .0366693 .1635711
------------------------------------------------------------------------------
b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg
Test: Ho: difference in coefficients not systematic
                      chi2(2) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                              = 0.18
                    Prob>chi2 = 0.9155
```

Since the Prob>chi2 is 0.9155, there is no enough reason to reject the null hypothesis. Therefore, the random effects model will be used for investment cash flow.

Using a panel structure, the final estimation results for testing our three hypotheses are summarized in Table 2.

TABLE 2
ESTIMATION RESULTS
Coefficient Estimates
(p-value)

	H_1 Model Cost of Goods Sold	*H_2 Model* Operating Costs	*H_3 Model* Investing Costs
β_0	0.0556 *(0.259)*	0.0136 *(0.055)*	0.0130 *(0.670)*
β_1	0.4178 *(0.000)*	0.2675 *(0.000)*	0.0609 *(0.768)*
β_2	- 0.4031 *(0.000)*	- 0.1619 *(0.001)*	0.0822 *(0.774)*
Adjusted R^2	0.2129	0.0776	-0.0568
Model	FE	FE	RE

Based on the above results, the final model would show that we accept our alternative hypotheses (H_1 and H_2) that the magnitude of cost of goods sold and the total operating costs increase as a function of an increase in revenues is greater than the magnitude of cost reduction as a function of an equivalent reduction in revenues. In other words, these two costs behave asymmetrically for listed industrial Philippine firms. Thus, we confirm the prevalence of sticky behavior for the cost of goods sold and total operating costs.

Using the costs of goods sold as proxies for our dependent variable, the β_1 has an estimated value of 0.4178 while β_2, -0.4031. This can be interpreted that for every 1% increase in revenues, there is a corresponding 0.42% increase in the cost of goods sold, but for every 1% decrease in revenues, there is only a 0.0147% decline in the cost of goods sold. This finding supports the study of Weidenmier and Subramaniam (2003) using data from the United States for the period 1979-2000.

Interestingly, the same results have been observed when we use operating costs as dependent variable. The β_1 has an estimated value of 0.2675 while β_2, -0.1619. This can be interpreted that for every 1% increase in revenues, there is a corresponding 0.27% increase in the operating costs, but for every 1% decrease in revenues, there is only a 0.11% decline in the

operating costs. The implication of this asymmetric behavior can be explained by the non-discretionary and oftentimes contractual obligations classified as operating costs, such as rental and utilities. Managers cannot easily discontinue these costs given their nature.

However, we accept our null hypothesis (H_3) that the relative magnitude of an increase in investment costs for an increase in sales revenue is not greater than the relative magnitude of a decrease in investment costs for a decrease in sales revenue. The high p-values of β_1 and β_2 indicate that the coefficients are not significant even at 90% significance level. The symmetric behavior of investment costs or capital expenditures with changes in sales indicates that Philippine firms adjust their long-term investment expenditures with changes in sales. This implies a non-strategic or optimistic perspective of managers in making these long-term investments.

CONCLUSIONS

Over the past decade after the publication of ABJ's seminal work on the cost stickiness phenomenon, the work has grown as it expanded the understanding of asymmetric cost behavior. The concept of asymmetric cost behavior is much broader than the naïve prediction that "costs are sticky" on the average. This has constituted a new way of thinking about costs and by natural extension, earnings/profitability/firm performance. While the traditional view of cost behavior adopts a more mechanistic relationship between cost and concurrent activity ("fixed" and "variable"), this new approach is based on the primitives of cost behavior – resource adjustment costs and resource commitment decisions by managers (Banker and Byzalov, 2014).

In the Philippine context, past studies have shown that sticky behavior is prevalent using discretionary costs (Uy, 2011 and 2014). In this study, we have also shown that this cost behavior pattern is not always present in all types of costs. The nature and type of costs matter as only cost of goods sold and operating costs demonstrate this, while investment costs do not.

While there are already a lot of studies conducted in the last decade on the symmetric cost behavior, there are still several unresolved issues in exsiting research and perhaps potential applications of asymmetric behavior. For instance, it would be important to develop empirical tests that can discriminate between efficient and excessive cost stickiness, and to identify performance methods and incentive systems that would discourage "bad" stickiness but do not deter "good" stickiness. Additionally, there is a need to incorporate the concept of cost asymmetry to traditional accounting practices and systems such as budgeting, standard costing, and even pricing decisions.

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AUDITOR QUALITY AND IFRS INFORMATION COMPARABILITY

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ABSTRACT

This study examines the difference in audit quality between Big 4 and non-Big 4 firms and how such difference is affected by the adoption of IFRS in China, a developing economy with low litigation risk. We measure audit quality using client financial statement comparability, a basic property of useful information emphasized by both IASB and FASB. We choose comparability as a proxy for audit quality because it can detect "within GAAP" earning manipulations and its continuous nature captures audit quality variations across all companies. Our findings indicate that financial statement comparability of Big 4 clients is higher than that of non-Big 4 clients. Furthermore, the higher comparability of Big 4 clients persists under both Chinese local accounting standards and IFRS. Finally, the audit quality gap between Big 4 and non-Big 4 firms remains relatively stable over the pre- and post-IFRS periods.

INTRODUCTION

This study examines the difference in audit quality between Big 4 and non-Big 4 auditors. The issue of whether Big4 firms provide higher quality audit service is important for accounting researchers who often rely on the Big 4 versus non-Big 4 dichotomy as a proxy for audit quality (Beatty, 1989; Gul et al. 2009). The issue also has significant practical ramifications in the selection of auditors by audit committees (CFA Institute Center, 2009; Moizer, 1997) and in loan and underwriting agreements (De Angelo, 1981).

A large body of research has examined the issue of Big 4 versus non-Big 4 audit quality (DeAngelo, 1981; Dopuch & Simunic, 1980; Khurana & Raman, 2004; Behn et al. 2008; Francis & Yu, 2009). Abnormal accruals, benchmark beating, timely loss recognition, analyst forecast accuracy, audit opinions, and litigation against auditors have been used as audit quality proxies in the literature (Becker et al. 1998; Krishnan, 2003; Behn et al. 2008; Lawrence et al. 2011; DeFond & Lennox, 2011). This study extends the research on audit quality by exploring a different audit quality matrix: the comparability of clients' audited financial statements.

Comparable information enables financial statement users to evaluate the merits of alternative investment opportunities for efficient capital allocation (SEC, 2000). Making financial information comparable was cited by the Financial Accounting Standard Board (FASB) as the primary reason for developing accounting standards (FASB 1980, par. 112). Reducing the divergence in accounting standards across countries in order to enhance the cross-country comparability of accounting information was also cited as the primary reason for the creation of International Accounting Standards Committee (IASC), the predecessor of the International Accounting Standards Board (IASB) (Camfferman and Zeff, 2007). While the widespread adoption of International Financial Reporting Standards (IFRS) has undoubtedly reduced the

divergence in accounting standards across countries, increased standard comparability alone would not lead to information comparability because information comparability is also affected by institutional environment, management reporting incentives, and audit quality. Particularly, given the numerous accounting choices under IFRS and the significant variations in enforcement infrastructure across countries, auditors play a critical role in the rigorous interpretation and consistent application of IFRS to produce comparable financial information (Ball, 2006). Consequently, for similar economic events, clients of high quality auditors should report more comparable accounting amounts, other things being equal. However, until recently, the literature has not examined the comparability of audited financial statements in audit quality studies[1]. This study attempts to bring the audit quality research and comparability studies together by examining audit quality of Big 4 versus non-Big 4 firms based on the cross-country comparability of clients' IFRS-based financial statements. Specifically, we investigate the difference in audit quality between Big 4 and non-Big 4 firms and how such difference is affected by the adoption of IFRS in China. We choose China for our study for two major reasons: (1) there are contradicting predictions and mixed evidence regarding Big 4 versus non-Big 4 audit quality in developing economies with weak institutional environment and low litigation risk, and (2) many of IASB's constituent countries are developing economies with weak institutional environment and low litigation risks.

Litigation risk avoidance and reputation protection are the two primary motivations cited in the audit literature for high quality audit service. Both motivations would yield the same prediction for developed economies with strong investor protection and high litigation risk. However, the two motivations provide very different predictions for developing economies with code law legal origins and low litigation risk. Specifically, given the weak institutions and very low litigation risk in most developing economies, the litigation risk avoidance theory would suggest no strong motivation for Big 4 firms to provide higher quality audit service. On the other hand, since Big 4 firms in low litigation environment still have a motivation to protect its reputation, the reputation protection theory would predict higher quality audit service by Big 4 firms.

The comparability measure used in this study was developed by De Franco, Kothari, and Verdi (2011) and was subsequently used in several comparability studies (Barth et al. 2012; Yip & Young, 2012). Following the procedures in De Franco, Kothari, & Verdi (2011), we compute comparability scores between Chinese and Hong Kong companies matched by industry and firm size. We then divide the observations into two subsamples based on whether the Chinese companies are audited by Big 4 or non-Big 4 firms. Using a sample of 40,426 observations for the period of 2006 and 2010-2012, we find that the overall cross-country comparability of Big 4 clients is higher than that of non-Big 4 clients. Furthermore, the higher comparability of Big 4 clients persists for both the pre- and post-IFRS periods. Finally, the comparability gap between Big 4 and non-Big 4 firms in the post-IFRS period was not significantly different from that in the pre-IFRS period, suggesting that the audit quality gap as measured by the cross-country comparability of clients' financial statements remains relatively stable over the pre- and post-IFRS periods. Taken together, our findings suggest that for similar economic events, Big 4 clients on average report more comparable accounting amounts. The results don't support the litigation avoidance theory, which predicts no difference in audit quality in China's low litigation risk environment. Instead, the findings are more consistent with the reputation protection theory, which predicts higher quality audit service by Big 4 firms in order to protect their reputation (Palmrose, 1988; Becker et al. 1998; Khurana & Raman, 2004; Behn et al. 2008).

Lawrence et al. (2011) report that differences in three widely used audit quality proxies in the literature largely reflects client characteristics (client size in particular). To ensure that our results are not driven by client characteristics, we included extensive controls for firm-level characteristics in our regressions. In addition, we use Petersen's two-way clustered analysis to correct for correlation across firms and over time in our panel data and a two-stage regression approach to control for potential self-selection bias. Therefore, our results are unlikely to be driven by client characteristics, correlation in the panel data, or self-selection bias.

This study contributes to both the IFRS comparability literature and the audit quality literature. The widespread adoption of IFRS by over 130 countries and all major stock exchanges in the world has stirred up research interest in cross-country comparability of IFRS-based financial statements. These studies generally focus on the improvement in cross-country comparability upon IFRS adoption and the impact of legal origins and other institutional environment on comparability (Barth et al. 2012; Yip & Young, 2012). To the best of our knowledge, we are the first to investigate the relationship between IFRS information comparability and audit quality. We document empirical evidence indicating a systematic difference in cross-country comparability of IFRS-based financial statements between Big 4 and non-Big 4 clients.

We also contribute to the audit quality literature. While both FASB and IASB emphasize comparability as a basic property of useful financial information, comparability has not been used as a proxy for audit quality in the literature. Francis et al.'s auditor style paper (2014) was the first study attempting to bring audit research and comparability studies together. However, their focus was on the relationship between comparability and auditor style by examining the within-country comparability of firm-pairs audited by the same Big 4 auditor versus different Big 4 auditors based on U.S. firms' GAAP-based financial statements. In contrast, our research focuses on the differences in cross-country comparability of IFRS-based financial statements of Big 4 versus non-Big 4 clients. Furthermore, our sample firms are from a developing economy with a weak institutional environment and low litigation risk. Given the widespread adoption of IFRS and many of IASB's constituents are developing economies with weak institutional environment and low litigation risks, our findings should be of interest to international accounting standards setting bodies, securities regulators, and investors.

The remainder of the study is organized as follows. Section 2 reviews the literature and develops the model. Section 3 describes sample selection procedures and the data. Section 4 presents empirical tests and results. The last section summarizes and concludes the paper.

LITERATURE REVIEW AND MODEL DEVELOPMENT

Numerous studies have examined the issue of audit quality of Big 4 versus non-Big 4 firms (DeAngelo, 1981; Dopuch & Simunic, 1980; Khurana & Raman, 2004; Behn et al. 2008; Francis & Yu, 2009). These studies used a variety of audit quality proxies, such as discretionary accruals, timely loss recognition; analyst forecast accuracy, and litigations against auditors. While comparability is one of the qualitative characteristics of useful accounting information and is the primary reason for the creation of accounting principles, it has not been used as a proxy for audit quality. In a recent study, Francis et al. (2014) attempt to bring the audit research and comparability studies together in their auditor style paper. Based on U.S. firms' GAAP-based financial statements, they find two firms audited by the same Big 4 auditor have more comparable earnings than two firms audited by two different Big 4 firms, and attribute the difference to auditor style (Francis et al. 2014).

We extend Francis et al.'s study by examining the difference in cross-country comparability of IFRS-based financial statements of Big 4 versus non-Big 4 clients in China, a developing economy with a weak institutional environment and low litigation risk. Instead of focusing on the difference in comparability between the same Big 4 firms versus different Big 4 firms, we focus on the difference between Big 4 and non-Big4 firms because the literature often relies on the Big 4 versus non-Big 4 dichotomy as a proxy for audit quality (Beatty, 1989; Mitton, 2002; Smart & Zutter, 2003; Gul et al., 2009). Furthermore, instead of the within-country comparability of GAAP-based financial statements, we choose to study the cross-country comparability of IFRS-based financial statements because over 130 countries and all major stock exchanges in the world have either adopted or permitted the use of IFRS. The Securities Exchange Commission (SEC) is currently also considering whether U.S. firms should be allowed to use IFRS for financial reporting. We focus on a developing economy with a weak institutional environment and low litigation risk because many of IASB's constituents are developing economies with weak institutional environment and low litigation risks. Finally, we choose a single-country setting to avoid the potential confounding effect of institutional differences in cross-country studies.

IFRS was created to reduce the diversity in accounting standards across countries and to enhance the cross-country comparability of reported financial information (Camfferman & Zeff, 2007). However, comparable accounting standards alone do not result in comparable financial information; its consistent interpretation and rigorous application as well as audit quality and legal enforcement also play an important role (Street & Gray, 2001; Ball et al. 2003; Ball, 2006; Cairns, 1999). Given that IFRS is "principle-based" and that many of IASB's constituents lack the infrastructure to rigorously enforce the application of IFRS (Ball et al. 2003; Leuz et al. 2003), auditors are expected to play an important role in the consistent interpretation and rigorous application of IFRS. Accounting, in essence, is the mapping of economic events into financial statements (De Franco, Kothari, and Verdi 2011). For similar economic events, clients of high quality auditors should report more comparable accounting amounts (i.e., have similar mappings), other things being equal. Thus, we contend that the differences in cross-country comparability of client IFRS-based financial statements can be used as a proxy for audit quality. To the best of our knowledge, we are the first to use the cross-country comparability of client IFRS-based financial statements as a proxy for audit quality.

Comparability studies generally use either input-based measures or output-based measures in assessing accounting information comparability (De Franco, Kothari & Verdi, 2011; Bradshaw & Miller, 2008; Bradshaw, Miller & Serafeim, 2009). When input-based comparability measures such as accounting methods are used, researchers must decide which accounting choices to use, how to weigh them, and how to account for variations in their implementation. To avoid such challenges, this study adopts the output-based comparability metrics, which was developed by De Franco, Kothari, and Verdi (2011) and was subsequently used by several comparability studies (Barth et al. 2012; Yip & Young, 2012).

Following De Franco, Kothari, and Verdi (2011), accounting is essentially a mapping of economic transactions to financial statements. That is,

$$Financial\ Statements_i = f_i\,(Economic\ Transactions_i) \qquad (1)$$

Where f_i () represents the accounting system of firm *i*. Equation 1 states that a firm's financial statements are a function of both the underlying economic transactions and how these

transactions are accounted for. We consider two firms' accounting systems to be comparable if they produce similar financial statements for similar economic transactions. Two firms *i* and *j* with comparable accounting should have similar mappings f_i (), such that for a given set of economic transactions, firm *i* would produce financial statements similar to those of firm *j*. Following De Franco, Kothari, and Verdi (2011), we use stock returns as a proxy for the net effect of economic transactions, and use earnings as a proxy for financial statements. Using eight semiannual sets of financial data, we estimate each firm's accounting function in the pre- and post-adoption periods separately using the following equation:

$$Earnings_{i,t} = \alpha_i + \beta_i Return_{i,t} + \varepsilon_{i.t} \quad (2)$$

Under the framework of Equation 2, $\hat{\alpha}_i$ and $\hat{\beta}_i$ are a proxy for the accounting function for firm *i*. Similarly, we obtain the proxy for firm *j*'s accounting function, $\hat{\alpha}_j$ and $\hat{\beta}_j$, by estimating Equation 2 for firm *j*. The closeness of the functions between the two firms represents the comparability between the firms (De Franco, Kothari, & Verdi, 2011). To assess the closeness of the two firms' accounting functions, we use $Return_{i,t}$ (a proxy for firm *i*'s economic transactions) and $\hat{\alpha}_i$ and $\hat{\beta}_i$ (a proxy for firm *i*'s accounting function) to predict firm *i*'s earnings using the following equation:

$$E(Earnings)_{ii,t} = \hat{\alpha}_i + \hat{\beta}_i Return_{i,t} \quad (3)$$

Consistent with De Franco, Kothari, and Verdi (2011), we use the same economic events of firm *i*, but the accounting function of firm *j* ($\hat{\alpha}_j$ and $\hat{\beta}_j$) to predict firm *i*'s earnings using the following equation:

$$E(Earnings)_{ij,t} = \hat{\alpha}_j + \hat{\beta}_j Return_{i,t} \quad (4)$$

Given that Equations 3 and 4 are estimated using the same economic events (i.e., firm *i*'s returns), if firm *i*'s and firm *j*'s accounting functions are comparable, they should produce similar accounting numbers (i.e., *E(Earnings)*). Consistent with De Franco, Kothari, and Verdi (2011), Barth et al. (2012), and Yip and Young (2012), we use the average absolute difference between predicted earnings based on firm *i*'s and *j*'s accounting function as our comparability measure ($CompAcc_{ijt}$). Specifically, we compute $CompAcc_{ijt}$ using the following equation:

$$CompAcc_{ij,t} = -\frac{1}{8} \times \sum_{t-7}^{t} \left| E(Earnings)_{ij,t} - E(Earnings)_{ii,t} \right| \quad (5)$$

Following De Franco, Kothari, and Verdi (2011), we added a negative sign in equation (5) so that greater $CompAcc_{ijt}$ values indicate greater accounting comparability.

The objective of this study is to examine (1) the difference in audit quality between Big 4 and non-Big 4 firms as measured by the cross-country comparability of client audited financial statements, and (2) how this difference is affected by the adoption of IFRS. To test the difference in cross-country comparability of Big 4 versus non-Big 4 clients, we divide all Chinese companies in our sample into the Big 4 and non-Big 4 subsamples based on their auditors. For

each subsample, we form firm-pairs of Chinese companies with Hong Kong companies matched by industry (the two-digit SIC code) and firm size.[2] We then compute the comparability scores, $CompAcc_{ij,t}$, for each firm-pair using the method described above. The mean and median comparability scores for the Big 4 and non-Big 4 subsamples are compared to see if there are any significant differences.

Studies on audit quality of Big 4 versus non-Big 4 firms using U.S. data generally find that Big 4 firms provide higher quality audit services than non-Big 4 firms using a variety of audit quality measures (DeAngelo, 1981; Dopuch & Simunic, 1980; Khurana & Raman, 2004; Behn et al., 2008; Francis & Yu, 2009). However, some recent studies find either no difference in actual audit quality between Big 4 and non-Big 4 firms (Boone et al. 2010) or the reported audit quality differences simply reflect clients' characteristics (Lawrence et al. 2011). The issue of audit quality of Big 4 versus non-Big 4 firms in developing economies with code law legal origins and low litigation risk also remains open with conflicting predictions and mixed evidence (Francis et al. 2003; Fan & Wong 2005; Li et al. 2008, Lin et al. 2009). Two motivations for high quality audit are cited in the literature: litigation risk avoidance and reputation protection. The litigation risk avoidance motivation has different implications in code law jurisdictions with low litigation risk (such as China) and common law jurisdictions where litigation risk is high (such as the U.S.). Specifically, even though in theory investors in China can sue corporations, their officers, and auditors when fraud occurs, there is generally a lack of judicial enforcement. There is a huge gap between theory and actual practice (Ball et al. 2003). Despite the numerous fraud and large numbers of lawsuits from Chinese investors, there have been no payments by auditors from court actions (Hutchens, 2003). Given the low litigation risk and weak investor protection in China, the litigation risk avoidance theory would suggest no strong incentives for Big 4 firms to exert greater efforts to reduce litigation risk, and therefore predicts no significant differences in audit quality between Big 4 and non-Big 4 firms. On the other hand, since Big 4 firms in China, as their counterparts elsewhere in the world, have a reputation to protect, the reputation protection theory would suggest that Big 4 firms are motivated to develop better in-house rules and to exert greater efforts in order to protect its reputation, and thus predicts higher audit quality for Big 4 firms. Since there is a lack of evidence in the literature regarding whether the reputation protection incentive alone is adequate to motivate higher quality audit service, we make no predictions and view this as an empirical issue.

The IFRS literature suggests that certain firm-level characteristics may affect financial statement comparability. The audit quality literature also suggests that client characteristics may affect certain audit quality proxies (Lawrence et al. 2011). To ensure that the difference in comparability between the Big 4 and non-Big 4 subsamples are not driven by client characteristics, we use the following regression equation to control for firm-level characteristics in assessing the effect of Big 4 versus non-Big 4 on comparability:

$$CompAcc_{ij,t} = \beta_0 + \beta_1 * Auditor_{ij,t} + \beta_2 * Size_{ij,t} + \beta_3 * Leverage_{ij,t} + \beta_4 * MKTBV_{ij,t} + \beta_5 * CFO_{ij,t} + \beta_6 * LossProb_{ij,t} + \beta_7 * Sales_{ij,t} + \beta_8 * Growth_{ij,t} + \beta_9 * CFO_{ij,t} + \varepsilon_{ij,t} \quad (6)$$

$Auditor_{ij,t}$ is a dummy variable which equals to one if the auditor is a Big 4 firm and zero otherwise. The other variables in the equation attempt to control for firm-level differences in firm size, leverage, market value to book value ratio, loss probability, sales, growth, and cash flows from operations. Our primary interest is the coefficient estimate for the auditor dummy

variable, β_1. A significantly positive β_1 value would indicate that financial statements are more comparable if audited by a Big 4 firm.

Next, we investigate how the adoption of IFRS in China affects audit quality by examining the differences in cross-country comparability between Big 4 and non-Big 4 clients for the pre- and post-IFRS periods, respectively. To test this, we further divide the Big 4 and non-Big 4 subsamples into pre- and post-adoption subsamples. We then collate the comparability scores between Big 4 and non-Big 4 clients for the pre- and post-IFRS periods. If Big4 firms provide higher quality audit service in terms of ensuring clients' rigorous and consistent interpretation of accounting standards and limiting clients' opportunistic reporting behavior, the comparability scores of Big 4 clients should be higher than that of non-Big 4 clients for both the pre- and post-IFRS adoption periods.

The observed difference in comparability for the pre- and post-IFRS periods can be affected by factors other than audit quality, such as the differences in standards quality (i.e., Chinese local standards versus IFRS) and firm-level characteristics. To isolate the effect of audit quality on comparability over the pre- and post-IFRS periods, we introduce two more independent variables into our regression: an accounting standard dummy variable and an interaction term of the standard and auditor dummy variables. Specifically, we use the following regression equation to assess changes in audit quality gap in the pre- and post-IFRS periods after controlling for differences in standard quality and firm-level characteristics:

$$\begin{aligned} CompAcc_{ij,t} = {} & \beta_0 + \beta_1 * Standard_{ij,\mathrm{t}} + \beta_2 * Auditor_{ij,\mathrm{t}} + \beta_3 * Auditor_{ij,\mathrm{t}} * Standard_{ij,\mathrm{t}} \\ & + \beta_4 * Size_{ij,t} + \beta_5 * Leverage_{ij,t} + \beta_6 * MKTBV_{ij,t} + \beta_7 * CFO_{ij,t} + \beta_8 \\ & * LossProb_{ij,t} + \beta_9 * Sales_{ij,t} + \beta_{10} * Growth_{ij,t} + \beta_{11} * CFO_{ij,t} \\ & + \varepsilon_{ij,t} \end{aligned} \quad (7)$$

Where $Standard_{ij,\mathrm{t}}$ is an accounting standard dummy variable which equals to one for post-IFRS period and zero otherwise. $Auditor_{ij,\mathrm{t}} * Standard_{ij,\mathrm{t}}$ is the interaction term of the auditor and standard dummy variables. The rest of the variables are defined the same as the above.

The coefficient estimate for the standard dummy variable, β_1, captures the effect of IFRS adoption on comparability. Since Chinese companies and Hong Kong companies use different accounting standards in the pre-IFRS period (Chinese local standards versus IFRS) and use the same standards in the post-IFRS period, one would naturally expect the cross-country comparability to improve in the post-IFRS period. However, if IFRS offers more reporting latitude than local standards and therefore provides more opportunities for managers to behave opportunistically, the adoption of IFRS may adversely affect financial statement comparability. While the net effect of these counteracting forces is unclear, given the findings of prior comparability studies that IFRS adoption generally improves comparability, we expect β_1 to be positive.

Our primary interest is in the coefficient estimates for the auditor dummy variable (β_2) and the interaction term (β_3). In the context of Equation 7, β_2 represents the audit quality gap in the pre-IFRS period while β_3 captures the difference in audit quality gap between the pre- and post-IFRS periods. Since the auditor dummy variable is defined as one if it is a Big 4 client and zero otherwise, a significantly positive coefficient estimate for the interaction term would indicate that the audit quality gap as measured by client financial statement comparability has widened in the post-IFRS periods. There are conflicting predictions in the literature regarding the

sign of the interaction term. Some researchers suggest that as Big 4 firms continue to gain in size and dominance, their sheer size can support greater in-house training programs (Francis & Yu, 2009). In addition, the growing complexity of accounting standards over time (particularly after the adoption of IFRS) increases Big 4 auditors' potential to add value (DeFond & Zhang, 2014; Magnan, 2008; Kim et al. 2012; DeGeorge et al. 2013). Consequently, a larger quality gap is predicted. However, others would argue that the frequent transfer of CPAs between Big 4 and non-Big 4 firms and the ensuing spillover in knowledge transfers would reduce the quality difference of in-house training programs between Big 4 and non-Big 4 firms over time, and therefore would reduce the audit quality gap (Lawrence et al. 2011). Consequently, we make no predictions regarding the sign of the interaction term and view it also as an empirical issue.

SAMPLE SELECTIONS AND THE DATA

Our initial sample is obtained from the China Securities Market and Accounting (CSMAR) database. The sample period is from 2003 to 2012. Semiannual data from 2003 to 2006 and from 2007 to 2012 were used to estimate $CompAcc_{ij,t}$ measures for 2006 (pre-IFRS period) and 2010 to 2012 (post-IFRS period), respectively. Since Hong Kong adopted the IFRS in 2005, the above test periods allow us to keep the accounting standard variable in Hong Kong constant over the sample period. We exclude financial and insurance firms from the sample because they have special operating characteristics and are subject to special accounting rules and additional regulations. We also exclude Chinese firms that are listed in international exchanges because these firms face different legal and enforcement environments. Finally, we exclude firms that are cross-listed in China and Hong Kong because the two sets of financial statements prepared by these firms are substantially the same. This procedure yields 40,426 pairs of $CompAcc_{ij,t}$ scores. Sample distribution by auditor and year is reported in Table 1.

Table 1
SAMPLE DISTRIBUTION

Year	Big 4	Non-Big 4	Total
2006	665	9,462	10,127
2010	879	9,848	10,727
2011	880	9,136	10,016
2012	820	8,736	9,556
Total	3,244	37,182	40,426

To mitigate the influence of outliers, all regression variables in our final sample were winsorized at 1% and 99% levels. Though not reported, our conclusions are substantially the same when the variables were winsorized at 5% and 95% levels. Sample descriptive statistics of all regression variables are presented in Table 2.

Though we did not report them, the parameter estimates of accounting functions from estimating Equation 2 are substantially similar to those in De Franco, Kothari, and Verdi (2011), validating both our sample selection procedures and comparability score estimation.

Table 2
DESCRIPTIVE STATISTICS

	Big 4 (N=3,244)		Non-Big 4 (N=31,782)	
Variables	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**
$Size_{ij,t}$	2.19	1.49	1.66	1.27
$Leverage_{ij,t}$	0.38	0.20	0.37	0.21
$MKTBV_{ij,t}$	2.44	6.43	3.35	8.22
$CFO_{ij,t}$	0.11	0.12	0.11	0.11
$LossProb_{ij,t}$	0.26	0.30	0.28	0.28
$Sales_{ij,t}$	0.18	0.20	0.19	0.25
$Growth_{ij,t}$	5.27	32.52	5.63	32.58

This table presents descriptive statistics of control variables used in all regressions.

Variable Definitions:
$Size_{ij,t}$ = firm size equals natural logarithm of total assets;
$Leverage_{ij,t}$ = leverage ratio equals total liability divided by total assets;
$MKTBV_{ij,t}$ = market value to book value ratio equals market value of equity divided by book value of equity;
$CFO_{ij,t}$ = cash flow ratio equals cash flows from operations scaled by total assets;
$LossProb_{ij,t}$ = loss probability is the proportion of quarters the firm reports a negative quarterly income before extraordinary items in the past eight semi-annual periods;
$Sales_{ij,t}$ = standard deviation of sales is calculated over the preceding eight semi-annual periods;
$Growth_{ij,t}$ = standard deviation of sales growth is calculated over the preceding eight semi-annual periods.

EMPIRICAL TESTS AND RESULTS

First, we examine the difference in cross-country comparability between Big 4 and non-Big 4 clients by comparing the mean and median comparability scores of the two subsamples. The mean and median comparability scores of the Big 4 and non-Big 4 subsamples are reported in Table 3. The mean comparability score for Big 4 clients (-0.067) is higher than that for non-Big 4 clients (-0.074), and the difference is statistically significant, suggesting that for similar economic events, Big 4 clients report more comparable accounting amounts. The results don't support the litigation risk avoidance theory, which predicts no significant differences in audit quality between Big 4 and non-Big 4 firms. Instead, the findings are consistent with the reputation protection theory, which suggests Big 4 firms exert greater efforts to provide higher quality audit service to protect their reputation (Palmrose, 1988; Becker et al. 1998; Khurana & Raman, 2004; Behn et al. 2008).

Lawrence et al. (2011) report that the differences in certain widely used audit quality proxies in the literature largely reflect client characteristics such as firm size. To ensure that the difference in comparability scores between Big 4 and non-Big 4 clients reported in Table 3 is not driven by firm-level characteristics, we estimated Equation 6 developed in Section 2 to control for firm size and other firm-level characteristics. The regression results are reported in Table 4, Column A. The results are consistent with those reported in Table 3. The coefficient estimate for the auditor dummy variable is positive and statistically significant, indicating that financial statements of Big 4 clients are more comparable than those of non-Big 4 clients after controlling for firm specific characteristics.

Table 3
COMPARABILITY SCORES OF BIG 4 VERSUS NON-BIG 4 CLIENTS

	$CompAcc_{ij,t}$	
	Mean	Median
Big 4 clients (N=3,244)	-0.081	-0.053
Non-Big 4 clients (N=37,182)	-0.091	-0.061
Difference in comparability scores	0.010***	0.008***
(T-Value/Wilcoxon Z-Value)	(10.99)	(12.76)

*, **, *** Denotes statistical significance at the 10%, 5%, and 1% levels, respectively.
Differences in means (medians) are assessed using a t-test (Wilcoxon rank sum test).

Table 4
REGRESSION RESULTS

Variables	Panel A OLS Regression	Panel B Two-way Clustered
Intercept	-0.090***	-0.090***
	(-8.85)	(-2.93)
$Auditor_{ij,t}$	0.008***	0.008**
	(6.33)	(2.58)
$Size_{ij,t}$	0.000	0.000
	(0.063)	(0.18)
$Leverage_{ij,t}$	-0.014***	-0.014
	(-3.41)	(-0.83)
$MKTBV_{ij,t}$	0.003***	0.003***
	(16.98)	(5.53)
$CFO_{ij,t}$	-0.018***	-0.018*
	(-3.44)	(-1.72)
$LossProb_{ij,t}$	-0.101***	-0.101***
	(-27.62)	(-8.84)
$Sales_{ij,t}$	-0.020***	-0.020***
	(-4.17)	(2.82)
$Growth_{ij,t}$	0.000***	0.000***
	(13.97)	(4.05)
Observations	40,426	40,426
Adjusted R^2	0.113	0.113

*, **, *** Denotes statistical significance at the 10%, 5%, and 1% levels, respectively, two-tailed.
Column A presents regression results using OLS regression. Column B presents regression results using Petersen's (2009) two-way clustered method.

The results reported in Tables 4, Column A are from ordinary least squares (OLS) regression using panel data pooled across firms and over time. Standard errors from OLS will be consistent as long as the regression residuals are uncorrelated across firms and over time. However such uncorrelatedness is unlikely to hold in our research context because of both market-wide shocks that induce correlation among firms and persistent firm-specific shocks that induce correlation over time (Thompson, 2011). To correct for simultaneous correlation along these two dimensions, we adjust standard errors for the correlation across firms and over time by clustering two-way (firm and time) using Petersen's two-way clustered method. We compute covariance estimator by adding the estimator that clusters by firms to the estimator that clusters by time and subtracting the usual heteroskedasticity-robust OLS covariance matrix. Results from the two-way clustered analysis using Equations 6 are reported in Table 4, Columns B. The regression results from Petersen's two-way clustered analysis reported in Column B are substantially the same as those reported in Column A, suggesting that our results are not driven by the correlation across firms and over time in our panel data. Taken together, the results in Tables 3 and 4 suggest that the cross-country comparability of Big 4 clients is higher than that of non-Big 4 clients after controlling for firm-specific characteristics and the correlation across firms and over time in the panel data.

Next, we investigate the effect of IFRS adoption on comparability by examining the differences in cross-country comparability of Big 4 and non-Big 4 clients for the pre- and post-IFRS periods. Comparability scores for the pre- and post-IFRS periods are reported in Table 5, Panels A and B, respectively.

Table 5
COMPARABILITY SCORES OF BIG 4 VERSUS NON-BIG 4 CLIENTS FOR PRE- AND POST-IFRS PERIODS

Panel A: Pre-IFRS Period	$CompAcc_{ij,t}$	
	Mean	Median
Big 4 clients (N=665)	-0.070	-0.048
Non-Big 4 clients (N=9,462)	-0.077	-0.055
Difference in comparability scores	0.007***	0.007***
(T-Value/Wilcoxon Z-Value)	(2.77)	(8.58)
Panel B: Post-IFRS Period	$CompAcc_{ij,t}$	
	Mean	Median
Big 4 clients (N=2,579)	-0.066	-0.045
Non-Big 4 clients (N=27,720)	-0.072	-0.049
Difference in comparability scores	0.006**	0.004***
(T-Value/Wilcoxon Z-Value)	(2.36)	(6.13)

*, **, *** Denotes statistical significance at the 10%, 5%, and 1% levels, respectively.
Differences in means (medians) are assessed using a t-test (Wilcoxon rank sum test).

Panel A reports comparability scores for Big 4 and non-Big 4 clients for the pre-IFRS period. The mean comparability score of Big 4 clients is -0.070, which is significantly higher than that of non-Big 4 clients, -0.077. The result suggests that financial statements of Big 4 clients are more comparable than those of non-Big 4 clients under the Chinese local accounting standards.

Panel B of Table 5 reports comparability scores for the post-IFRS period. Note that comparability scores for both Big 4 and non-Big 4 clients reported in Panel B are higher than those reported in Panel A, suggesting that the adoption of IFRS in China improved the cross-country comparability of Chinese companies, which is consistent with the findings in prior comparability studies. More importantly, the mean comparability score of Big 4 clients (-0.066) remains significantly higher than that of non-Big 4 clients (-0.072). In summary, the results in Table 5 suggest that the adoption of IFRS in China improved the cross-country comparability of both Big 4 and non-Big 4 clients. Furthermore, the comparability of Big 4 clients is higher than that of non-Big 4 clients under both the local accounting standards and the IFRS. The results reported in Table 5 are consistent with the extant audit literature, which generally finds that Big 4 firms provide higher quality audit services (Palmrose, 1988; Becker et al. 1998; Khurana & Raman, 2004; Behn et al. 2008).

Finally, we examine changes in the audit quality gap between Big 4 and non-Big 4 firms upon the adoption of IFRS in China by estimating Equation 7 developed in Section 2. In addition to the auditor dummy variable and control variables for firm-level characteristics used in Equation 6, we add an accounting standard dummy variable and an interaction term of the auditor and standard dummy variables in Equation 7. The additional independent variables allow us to assess the audit quality gap for the pre- and post-IFRS periods after controlling for the differences in accounting standard quality as well as firm-level characteristics. Our primary interest is the coefficient estimate for the interaction term of the auditor and standard dummy variables, β_3. In the context of Equation 7, β_3 captures the change in audit quality gap between pre- and post-IFRS periods whereas β_2 represents the audit quality gap for the pre-IFRS period. A significantly positive (negative) coefficient estimate for the interaction term (β_3) would suggest that the audit quality gap has widened (narrowed) in the post-IFRS period over the pre-IFRS period. The regression results using OLS regression and Petersen's two-way clustered analysis are reported in Table 6, Panel A and Panel B, respectively.

The coefficient estimate for the accounting standard dummy variable, β_1, reported in Panel A is positive and statistically significant, indicating that the adoption of IFRS in China has improved financial statement comparability in general. This result is consistent with findings in prior IFRS comparability studies. The coefficient estimate for the auditor dummy variable, β_2, which captures the difference in comparability between Big 4 and non-Big 4 firms in the pre-IFRS period, is also positive and statistically significant. This result is consistent with that reported in Panel A of Table 5, suggesting that the comparability of Big 4 clients is significantly higher than that of non-Big 4 clients in the pre-IFRS period (i.e., under Chinese accounting standards). More importantly, the coefficient estimate for the interaction term, β_3, is not significantly different from zero, suggesting no significant changes in comparability gap upon the adoption of IFRS in China. The results reported in Panel B using Petersen's two-way clustered method are substantially the same as those reported in Panel A. Although not reported, our conclusions are unaltered after controlling for potential clients' self-selection bias using a two-stage approach.

Table 6
REGRESSION RESULTS

$$CompAcc_{ij,t} = \beta_0 + \beta_1 * Standard_{ij,t} + \beta_2 * Auditor_{ij,t} + \beta_3 * Auditor_{ij,t} * Standard_{ij,t} + \beta_4 * Size_{ij,t} + \beta_5 * Leverage_{ij,t} + \beta_6 * MKTBV_{ij,t} + \beta_7 * CFO_{ij,t} + \beta_8 * LossProb_{ij,t} + \beta_9 * Sales_{ij,t} + \beta_{10} * Growth_{ij,t} + \beta_{11} * CFO_{ij,t} + \varepsilon_{ij,t} \quad (7)$$

Variables	Panel A OLS Regression	Panel B Two-way Clustered
Intercept	-0.071***	-0.071***
	(-6.56)	(-3.59)
$Standard_{ij,t}$	0.007***	0.007**
	(7.58)	(2.21)
$Auditor_{ij,t}$	0.007***	0.007***
	(2.59)	(3.78)
$Auditor_{ij,t*}$ $Standard_{ij,t}$	0.002	0.002
	(0.63)	(0.98)
$Size_{ij,t}$	-0.001*	0.001
	(-1.71)	(0.81)
$Leverage_{ij,t}$	-0.011**	-0.011
	(-2.44)	(-0.67)
$MKTBV_{ij,t}$	0.003***	0.003***
	(16.73)	(5.45)
$CFO_{ij,t}$	-0.011**	-0.011
	(-2.18)	(-1.10)
$LossProb_{ij,t}$	-0.104***	-0.104***
	(-28.08)	(-8.14)
$Sales_{ij,t}$	-0.020***	-0.020***
	(-4.15)	(2.85)
$Growth_{ij,t}$	0.000***	0.000***
	(13.84)	(4.02)
Observations	40,426	40,426
Adjusted R^2	0.115	0.113

*, **, *** Denotes statistical significance at the 10%, 5%, and 1% levels, respectively, two-tailed.
Column A presents regression results using OLS regression. Column B presents regression results using Petersen's (2009) two-way clustered method.

Variables definitions:
Standard = accounting standard dummy variable equals one for post-IFRS period and zero otherwise;
Auditor = auditor dummy variable equals one if the Chinese company is a Big 4 client, and zero otherwise;
*Auditor*Standard* = an interaction term of the auditor and standard dummy variables.
All control variables are defined in Table 2.

In summary, the empirical results of this study indicate that for similar economic events, Big 4 clients report on average more comparable accounting amounts than non-big 4 clients.

The difference in comparability between Big 4 and non-Big 4 clients persists across the pre- and post-adoption periods, and remains relatively stable. The results are unlikely to be driven by firm-specific characteristics, the correlation across firms and over time of the panel data, or clients' self-selection bias.

CONCLUSIONS

This study examines the differences in audit quality between Big 4 and non-Big 4 firms and the effect of IFRS adoption on audit quality gap. Differing from prior audit quality studies, we measure audit quality by the cross-country comparability of client IFRS-based financial statements. Using a sample of Chinese companies for the period of 2006 and 2010-2012, we find that cross-country comparability of Big 4 clients is generally higher than that of non-Big 4 clients. Furthermore, the higher comparability of Big 4 clients persists across both the pre- and post-IFRS periods. Finally, the audit quality gap between Big 4 and non-Big 4 firms, as measured by the cross-country comparability of client financial statements, remains relatively stable over the pre- and post-IFRS periods.

This study employed the comparability measure developed by De Franco, Kothari, and Verdi (2011), who use earnings as the summary measure of accounting information. While earnings are arguably the most important summary measure of accounting performance, it captures only one financial statement dimension. Future studies may explore multidimensional measures of financial statement comparability that combine both the income statement and the balance sheet perspectives.

ENDNOTES

1 Francis et al. (2014) attempt to bring the audit research and comparability studies together in their study of auditor style. Using U.S. data, they find that financial statements audited by the same Big 4 firm are more comparable that those audited by different Big 4 firms, and attribute such difference to auditor style. Our study differs from Francis et al.'s study in two major aspects. First, Francis et al. focus on the relationship between auditor style and comparability by examining firm-pairs audited by the same Big 4 firm versus different Big 4 firms whereas our study investigates differences in comparability between Big 4 versus non-Big 4 clients. Second, Francis et al. focus on within-country comparability of U.S. firms' GAAP-based financial statements whereas our study focuses on the cross-country comparability of Chinese companies' IFRS-based financial statements.

2 We choose Chinese and Hong Kong companies to form our firm-pairs because while Mainland China and Hong Kong are one country, they have difference economic systems, legal origins, levels of investor protection and litigation risks. This unique institutional setting allows us to investigate IFRS-based financial statement comparability across different legal origins and litigation risks without some of the confounding factors in cross-country studies.

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