The Choice of the Financial Year-End: Does It Matter?
An International Evidence

Radhi Al-Hamadeen[1] , *Frances Issa*[2] *and Robin Hewins*[3]

ABSTRACT

This paper examines how specific firm characteristics (size, industry, audit fees and age) and firm performance influence the choice of financial year-end (December *vs.* non-December). The sample consists of companies from Australia, France, Germany, Japan, the United Kingdom and the United States to tackle issues with international diversity. Both domestic and international regulations for each country are addressed in developing expectations and conclusions. The results of the study show that December is generally becoming less and less 'popular' compared to a few years back. The results also revealed that December year-end firms tend to be larger and operate in certain types of industries with some industries preferring to close their books at certain dates, whether a December or a non-December month. As a result, financial-reporting comparability issues may arise if firms depart from the year-end chosen by most similar firms. It is also found that older firms tend to have December as their year-end, while relatively younger firms prefer a non-December year-end. Moreover, firms tend to prefer December as audit fees go up. Finally, firms with better performance are less likely to have December as their fiscal year-end. These findings show the importance of the topic and suggest conducting more research by academics and standard setters.

Keywords: Financial reporting, Year-end choosing, Corporate characteristics, Global businesses.

1 Associate Professor, Department of Accounting, King Talal School of Business Technology, Princess Sumaya University for Technology, Amman 11941 Jordan. r.hamadeen@psut.edu.jo
2 Audit Manager, Rödl & Partner, Ltd., Birmingham B3 2HB UK frances_issa93@hotmail.com
3 Senior Teaching Fellow, WBS Accounting Group, Warwick Business School, The University of Warwick, Coventry CV4 7AL UK. r.hewins@wbs.ac.uk

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اختيار نهاية السنة المالية: هل هذا مهم؟ دليل من الممارسات الدولية

راضي الحمادين¹، فرانسيس عيسى²، روبين هيوينز³

ملخص

تبحث هذه الدراسة في تأثير خصائص الشركة (الحجم، والقطاع الاقتصادي، ورسوم التدقيق، والعمر) وأداء الشركة على اختيار نهاية السنة المالية (ديسمبر أو غير ديسمبر). وتتكون عينة الدراسة من الشركات العاملة في كلٍ من أستراليا وفرنسا وألمانيا واليابان والمملكة المتحدة والولايات المتحدة، وذلك بهدف معالجة القضايا ذات التنوع الدولي. وتم تناول كل من التشريعات ذات العلاقة، المحلية منها والدولية، لكل بلد عند تطوير التوقعات والفرضيات المتعلقة بهذه الدراسة. وقد أظهرت نتائج الدراسة أن شهر كانون الأول (ديسمبر) بشكل عام أصبح أقل استخداماً مقارنةً بالسنوات القليلة الماضية. كذلك كشفت النتائج أن الشركات الأكبر من حيث الحجم تميل إلى استخدام شهر ديسمبر لإغلاق حسابات السنة المالية، وينطبق ذلك على بعض الشركات التي تعمل في قطاعات اقتصادية محددة مع تفضيل بعض القطاعات لإغلاق حساباتها في تواريخ معينة (سواء في شهر ديسمبر أو غير ديسمبر). ونتيجة لذلك، فقد تنشأ صعوبات تتعلق بقابلية مقارنة التقارير المالية إذا لم تلتزم الشركات بتاريخ نهاية العام الذي تختاره معظم الشركات المماثلة. وقد دلّت النتائج على أن الشركات الأقدم تميل إلى أن تكون نهاية السنة المالية في ديسمبر، بينما تفضّل الشركات الأصغر نسبيًا أن تكون نهاية السنة المالية في غير شهر ديسمبر. وفي السياق نفسه، فقد أظهرت النتائج أن الشركات تميل إلى تفضيل شهر ديسمبر مع ارتفاع رسوم التدقيق. وأخيرًا، فقد أشارت نتائج الدراسة إلى أن الشركات ذات الأداء الأفضل من غير المرجح أن يكون شهر ديسمبر هو نهاية السنة المالية بالنسبة لها. وتُظهر هذه النتائج أهمية موضوع "اختيار نهاية السنة المالية"، وتقترح إجراء المزيد من الأبحاث والدراسات من قبل الأكاديميين وواضعي المعايير المحاسبية.

الكلمات الدالة: التقارير المالية، اختيار نهاية السنة المالية، خصائص الشركات، الشركات العالمية.

1 قسم المحاسبة، كلية الملك طلال لتكنولوجيا الأعمال، جامعة الأميرة سُمية للتكنولوجيا، عمان 11941، الأردن.

2 قسم التدقيق، رودل وشريكه المحدودة، بيرمنغهام، المملكة المتحدة.

3 قسم المحاسبة، كلية ورويك للأعمال، جامعة ورويك، كوفنتري، المملكة المتحدة.

Introduction

A fiscal or financial year-end is an accounting year that does not necessarily end on December 31. Most companies prefer December as their fiscal year-end, while relatively fewer companies tend to have different year-ends across the year (e.g. March, June or September). No disclosure is generally required for the reason behind the choice of year-end. Domestic regulations and accounting standards in many countries usually allow a company to choose its year-end (Kamp, 2002). This may justify the low attention given by researchers examining this issue. Two of the early studies that explored this subject are Smith and Pourciau (1988) and Huberman and Kandel (1989). They investigated how the choice of fiscal year-end (December *vs.* non-December) is influenced by firm characteristics, such as size, industry, market risk and financial leverage. They aimed to show that generalizability in empirical accounting research can be affected if the sample used in testing a hypothesis was restricted by firms' fiscal year-end. Accordingly, many notable researchers' conclusions may as a result have biased outcomes, such as Ball and Brown (1968) and Beaver (1968) who restricted their samples to either December or non-December year-end companies, but not to both.

There is little academic research on how the choice of fiscal year-end affects accounting research and practice (Lu et al., 2013). This study, therefore, aims to shed light on how the choice of fiscal year-end affects the generalizability of market-based research results. We argue that the presence of restrictions in sample selection to December or non-December year-end entities may significantly affect generalizability in market-based research (Atiase, 1985; Defeo, 1986). Limiting a sample to specific sub-groups may result in the sample not being a random selection from the population and, thus, may affect the overall results of a research (Smith and Pourciau, 1988). Additionally, the inability to correctly match treatment and control variables may lead to a reduction in a model's statistical power (Kinney, 1986). We further examine whether the choice of

fiscal year-end is associated with firm performance. We argue that many executive managers have incentive contracts that are based on share prices or revenues and the existence of a relationship between fiscal-year end and these may result in managers adjusting the firm year-end to maximize their benefits.

Existing literature generally agrees that the choice of period-end should be given more attention for several reasons. Various academic researchers restrict their samples into December-only firm observations, as there is no solid evidence that shows the downside of this choice. It was not until recently that this area started occupying some attention, so that the notion of an association between choice of financial year-end and specific firm characteristics, such as firm size or industry, arose. For instance, Smith and Pourciau (1988) found that there is a relationship between firm size and the financial year-end, which could bias samples restricting observations to a specific year-end, as that would also indirectly restrict observations to firms of specific sizes. Thus, this may lead to the sample not being random and empirical results being misleading. As for the accounting practice, Oyer (1998) found a possible relationship between management incentives and the variation of financial year-end effects across industries. This means that managers might choose financial year-ends that would affect firm performance in such a way that the final result would maximize their personal benefits. These reasons offer motivation to further research this area in order to prove or disprove these conclusions.

Overall and based on reviewing the relevant literature, it could be stated that there are several gaps that the current study tries to address in addition to some implications. This includes potential bias in previous and future studies as a result of directly or indirectly choosing populations based on company year-ends, which in turn raises the question as to whether further research needs to be done on the

specific characteristics that affect companies' year-end choice to avoid falling in the above bias. Furthermore, it is evident that there is very limited research that discusses the above two points and this paper suggests areas to be looked at to bridge that gap.

The key objective of this research is to show how specific firm characteristics (i.e., size, industry, audit fees and age) and firm performance influence the choice of financial year-end. To achieve this objective, the study addresses two main questions:

a) What are the firm's characteristics (among size, audit fees, age and industry) associated with the choice of fiscal year-end (December vs non-December)?

b) Does the choice of financial year-end respond to a specific firm performance indicator (i.e., return on equity)?

In studying both questions, international diversity is embedded within to improve the accuracy and reliability of the results. In this study, firms from six countries with major capital markets are included in the sample, which are the US, UK, Japan, Australia, France and Germany[1]. The study also considers the effect of domestic and international reporting requirements for each of these countries. This paper contributes to the literature by introducing new variables that may affect the choice of financial year-end. These variables were not given much attention in prior research (i.e., audit fees, age and firm performance).

In addition to the introduction section indicated above, the rest of the paper is divided into five main sections as follows: the next section presents the previous literature and hypotheses development, followed by illustrating the fiscal year-end regulations for the targeted countries. Then comes a section that shows the research methodology and methods used in this study, followed by a section that presents the research results and finally, the last section shows a discussion of the results and the research conclusions along with suggestions for future research and limitations faced in this study.

Previous Literature and Development of Hypotheses

A fiscal or financial year is a period used by entities to prepare their annual financial statements (Lu et al., 2013). The date which entities use to close their financial year is called the fiscal or financial year-end. Many studies assume uniformity in the choice of financial year-end, especially in forming their samples. The grouping of samples according to their fiscal year-end by some researchers (see Ball and Brown, 1968; Lipe, 1986; Rayburn, 1986) created concerns about whether the generalizability of their results was reliable. Ball and Brown (1968) admitted that the generalizability of their results may be limited due to limiting their sample's year-end to December only. Smith and Pourciau (1988) sought to investigate whether a relationship exists between the choice of year-end and certain market characteristics. They concluded that firms with a December year-end are larger and have smaller betas in comparison with non-December year-ends, while leverage ratios had no relationship with the choice of firms' year-end. Moreover, Smith and Pourciau (1988) found industry concentrations for December year-ends in regulated or recently deregulated industries. Huberman and Kandel (1989) further explored the association between fiscal year-ends, firm size and industry. A positive relationship was noted between a firm's size and the prospect of its fiscal year ending with the calendar year across various industries. Furthermore, they discussed some of the implications behind the choice of fiscal year-ends. For instance, a concentration on a specific year-end date would lead to a strong demand for auditing and other professional services around that cluster, which may render them more expensive around that time.

However, both studies were conducted on listed firms in the US. Only a more recent study by Kamp (2002) was conducted to address the effect of international diversity on firms' fiscal year-end choice.

His study included two determinants of the year-end choice: *national legislation* and *seasonality*. He concluded that national legislation has a stronger impact on the choice of fiscal year-end than seasonality. Internationally, a drift towards December was noted with only a few entities making changes in their fiscal year-ends with the motivation of enhancing comparability. Additionally, Kamp (2002) suggested that when international diversity is considered, the choice of the fiscal-year end is no longer affected by firm size, which is contradictory to previous literature findings. This current study follows existing literature in being concerned with one full fiscal year only and not interim periods. Accordingly, based on the discussion above, the first hypothesis in this study is formed as:

H1$_a$: There is no relationship between financial year-end and firm size after controlling for international diversity.

H1$_b$: There is a relationship between financial year-end and firm size after controlling for international diversity.

Kamp (2002) discussed the importance of the choice of fiscal year-end by interlinking literature with practice. He commented on the trend of having a concentration of specific year-ends in a certain industry and how that might affect comparability. Kamp (2002) argued that diversity in fiscal year-ends offers a more constant flow of economic data, which would enhance the immediate reaction by policymakers to certain trends. De Franco et al. (2011) stated that firms with weaker comparability or firms that do not follow the specific industry financial year-end cluster are in a negative manner in contrast to those with a stronger one. Industry concentrations in financial year-ends may also be caused by the seasonality of businesses in that sector (Lu et al. 2013). For example, if the year-end is close to an intense selling season, the company may lack the resources and manpower to deal with both inventories and annual account closing. Huberman and Kandel (1989) found that firms tend to choose fiscal year-ends that correspond with their inventory cycles. Therefore, firms may choose fiscal year-ends that more appropriately distribute employee efforts and resources throughout the year to maximize efficiency and lower costs.

On the other hand, legislation was found to influence the choice of year-end to a higher degree than business seasonality (Kamp, 2002). The current study addresses both domestic legislations and accounting standards' views on the choice of financial year-ends. Both International Accounting Standards Board (IASB) and Financial Accounting Standards Board (FASB) identify comparability as a qualitative characteristic that enables users to recognize similarities and differences among various firms and specific industries (for further details and developments on comparability, see FASB [2020]). However, when it comes to the choice of financial year-end, no guidance is provided by any of these boards (Kamp, 2002; Sinha and Fried, 2008). Therefore, if this study finds an association between the choice of financial year-end and comparability through specific industry concentrations, it would reveal the importance of considering this topic and how it may affect the accounting practice on one hand and academic research on the other. Moreover, Sinha and Fried (2008) reported competitive forces as another variable that may cause a firm's fiscal year to deviate from the annual cycle of business activity. Given the unanimous agreement of the literature discussed previously (Huberman and Kandel, 1989; Kamp, 2002; Smith and Pourciau, 1988) regarding a concentration of specific year-ends in multiple industries, the following hypothesis is assumed:

H2$_a$: Specific financial year-end date preferences do not exist in certain industries.

H2$_b$: Specific financial year-end date preferences exist in certain industries.

Another variable that the financial year-end may have influence on is audit fees. Previous studies usually linked audit fees with firm size (Pong and Whittington, 1994), complexity of operations (Whisenant et al. 2003) and industry specialization (Craswell et al., 1995), but they rarely do when it

comes to auditees' choice of financial year-end. Depending on domestic legislations, firms have to comply with tax and other regulatory authorities by submitting their audited financial statements within a predetermined deadline. With the presence of high-tech accounting information systems, this study assumes that audit procedures can take place within a few days from year-end dates. This may cause an increase in demand for auditing around that period, which in turn results in auditors charging higher fees for firms requiring audits with deadlines that are very close to each other (Huberman and Kandel, 1989). Therefore, having diversified fiscal year-ends may decrease these expenses on firms, as auditors will have a more evenly spread workload throughout the year (Kamp, 2002). This can lead to managers strategically positioning their fiscal year-ends to be far away from the high audit demand cluster if it leads to a material discount on audit fees. In the same context, it has been argued that firm size may play a role in the choice of financial year-end when it comes to audit fees. Previous empirical studies showed a strong correlation between firm size and audit fees; so, for smaller firms, the discount on audit fees may not be worth altering the company's year-end. It is expected that larger firms, on the other hand, tend to have a bigger motive to do so. Therefore, the discussion above leads to the study's third hypothesis as follows:

H3ₐ: Audit fees do not have an influence on the choice of financial year-end.

H3ᵦ: Audit fees have an influence on the choice of financial year-end.

The last variable included in this study to achieve its first objective is firm age, which is considered an important determinant of firm dynamics (Evans, 1987). According to Dickinson (2011), the firm passes through five different stages during its life cycle/age; this includes: introductory stage, growth stage, maturity stage, shake-out stage and decline stage. Abu Rumman and Al-Debi'e (2020) stated that the annual financial performance measures (exclusively, the net income and the cash flow) are value-relevant in certain stages of the firm age (i.e., growth, maturity and

shake-out) without stating when these measures should be exactly done (during the financial year or at the end of it). To date, no previous literature covers the relationship between firm age and the choice of financial year-end. Older companies have faced many of the global market's numerous ups and downs and frequent changes in domestic and international legislations. Accordingly, this study assumes that the experience which older firms have in the market is considered an advantage over newer firms. Given the drift towards a December year-end (Kamp, 2002), more recently incorporated companies may follow this trend instead of applying a different date. That leads to this study's fourth hypothesis below:

H4ₐ: Older (newer) firms are not expected to prefer non-December (December) year-ends.

H4ᵦ: Older (newer) firms are expected to prefer non-December (December) year-ends.

Various studies analyzed the number of firms that changed from December to non-December year-end, or *vice versa*, in the long term (see Lu et al., 2013; Porter et al., 2000). Usually, domestic legislation requires companies to disclose the reason behind this change. However, Lu et al. (2013) and Porter et al. (2000) found that around 15% and 14% of the companies, respectively, did not disclose the reason behind the change in their year-end. This leniency by legislators may indicate how the notion of the financial year-end choice is not being considered a critical issue. This study focuses on proving this statement otherwise. As for the companies that disclosed the reason behind the change, Lu et al. (2013) found that most of them did so to match their year-ends with their parent/subsidiary units.

To summarize the hypotheses for the first research objective, it is believed that the choice of financial year-end is influenced by the following elements: (1) firm-specific characteristics, such as firm size, beta, … etc.; (2) domestic/international requirements, such as

local tax legislations; (3) industry concentrations to enhance comparability depending on business seasonality; and (4) resource allocation directed towards high efficiency and lower costs.

The second objective of this study is to examine whether management choice of financial year-end is associated with firm performance. Tahat et al. (2021) stated that investors usually consider accounting information disclosed at the end of the financial year when making investment decisions, while Bataineh et al. (2019) indicated that the companies' reported performance is associated with ownership structure and corporate governance rather than any other corporate characteristics. Nevertheless, Beaver (1968) showed how the fiscal year-end can affect the variance in stock prices after earning announcements. Sinha and Fried (2008) stated that much firm-related information becomes clear only at the end of the reporting period, not only for external parties, but for internal parties as well. They described the choice of period end as the simultaneous timing of both information acquisition and disclosure, which managements may use to their advantage. Some companies have a period-end of 52 weeks, which gives 1-2 days closing reaction advantage over peer companies that use the last day of a given month. Moreover, companies may change their year-ends to manage their earnings and achieve predetermined results. For instance, when Goldman Sachs altered its year-end from November to December for the fiscal year 2009, it caused December 2008 to be totally omitted from their reports, as it did not appear in the 2008 annual financial statements or the 2009 interim financial statements. That lost month was used to hide many of the company's losses and report a huge profit in the first quarter of 2009.

As earning management is assumed to vary systematically with management incentives (Du and Zhang, 2013), the choice of financial year-end might be one technique that managers would use to achieve biased earnings. Du and Zhang (2013) explained the various incentives behind this managerial behaviour. The most intuitive reason is executive compensation, especially when based on share prices (i.e., share option packages). If reporting earnings before competitors positions the company's share price favourably (unfavourably), managers will probably (not) report them earlier to maximize their personal benefit. Another reason is to manage the earnings of a period with low stock returns, reporting misguided earnings to boost the firm's financial position. This can also be linked to management compensation if the remuneration contract is linked with earnings per share. Oyer (1998) argued that managers tend to manipulate the timing of sales revenue to maximize their compensation plan benefits. He established empirical evidence to show that managers' reaction to non-linear incentive compensation plans is consistent with the variation of fiscal-year effects across industries.

With these possible incentives related to the choice of financial year-end, managers may act opportunistically and manipulate earnings, which leads to inaccurate results of firm performance. Specifically, this study focuses on finding out whether there is a relationship between the choice of fiscal year-end on one end and a firm performance indicator on the other. This specific area has not been researched in depth and is one of the main contributions to the literature. According to the discussion above, the last hypothesis in this research is as follows:

H5$_a$: There is no association between the choice of financial year-end and firm performance.

H5$_b$: There is an association between the choice of financial year-end and firm performance.

Fiscal Year-End Regulations

This part of the study discusses the domestic and international legislations related to the choice of financial year-end. Companies and tax law requirements related to financial year-ends for each country are summarized in this part of the study. Internationally, accounting standards provide no

guidance as to which financial year-end to choose. However, in the case of a change in the financial year-end, International Accounting Standard (IAS) 1 requires companies to disclose the reasons for the change and state that the financials are not comparable. Similarly, US Generally Accepted Accounting Standards (GAAP) leave the choice of financial year-end to the entities (Sinha and Fried, 2008). Domestically, countries may have different requirements which are summarized below.

The United Kingdom

The UK's Companies Act (2006) allows companies to choose any year-end date as their accounting reference date under the calendar year. Entities that choose to alter their reporting period are obliged to report that to the registrar of companies. The government's fiscal year runs from 6 April to 5 April (CIA: The World Factbook, 2020). April is also the reference by which the UK corporation tax is charged, but companies' tax deadlines may vary depending on their financial year-ends.

The United States

The US has a more complex law structure, as each state possesses its own corporate law. The Internal Revenue Service's (IRS) online publication is used to extract the needed information (see https://www.irs.gov/publications). Usually, companies can adopt either a calendar year or a fiscal year (12 consecutive months or a 52-53-week period) as their year-ends. In some cases, the IRS enforces a required tax year. The government's fiscal year runs from 1 October to 30 September (CIA: The World Factbook, 2020). The fiscal-year tax deadline for partnerships and corporations is 3.5 months and 4.5 months, respectively, following the closure of their tax year. Therefore, the US is similar to the UK in the varying tax deadline according to firms' financial year-ends.

Japan

Standard setters in Japan believe that accounting should focus on developing the national economy as a whole (Walton et al., 1998). Japan's Companies Act no. 86 (2005) does not provide guidance when it comes to choosing the business-year end. However, some companies are bound to have a certain year-end of 1 April to 31 March if they fall within specific criteria under the Financial Instruments and Exchange Act no. 25 (1948). Financial institutions have to submit a business report within three months after the end of their financial year. Japanese companies' taxable year depends on their fiscal year-end (KPMG, 2015) and altering it requires disclosing the reason behind that decision, making it similar to the US and the UK. Each taxable year should not consist of more than one calendar year and companies are allowed to have taxable periods that are quarterly based (KPMG, 2015). For that reason, it is expected that there will be no preference for a December year-end, but for distribution along the year, with a preference for March. The government's fiscal year runs from 1 April to 31 March (CIA: The World Factbook, 2020).

Australia

The Australian Corporations Act no. 50 (2001) mandates companies to have a financial year of 12 months or 52-53 weeks long but leaves them the choice as when to end it. Australia has a mandatory tax period spanning from 1 July to 30 June (Lu et al., 2013), which is also the government's fiscal year (CIA: The World Factbook, 2020). Therefore, the majority of companies have a 30 June year-end date in Australia. Listed companies are required to publicly announce any changes in their year-end date through the Australian Securities Exchange (ASX).

Germany

In Germany, the financial statements must be prepared within three months from the period end and listed companies have to publish them within four

months. The typical tax year is the calendar year, but it may vary according to each company's financial year-end. Tax returns must be filed by 31 May of each year, but can be extended to 31 December for companies that use a tax advisor (Deloitte, 2016c). The government's fiscal year-end follows the calendar year (CIA: The World Factbook, 2020).

France

According to the French regulations, the annual financial data must be approved and deposited to the local commercial court within seven months from the period's end. Like Germany, the typical tax year is the calendar year, but it may vary according to the choice of each company's financial year-end. The final tax settlement must be made by 30 April or within three months of the chosen non-calendar year-end (Deloitte, 2016b). This may lead to a concentration in the calendar year-end choice, as by choosing it companies are given one additional month to meet their deadline. The government's fiscal year-end also follows the calendar year (CIA: The World Factbook, 2020).

China

China's Company Law and relevant regulations require companies to prepare financial statements every calendar year-end (Deloitte, 2016a). Both the government's and tax fiscal years end in December (CIA: The World Factbook, 2020). Thus, it is expected that there is a very high number of companies with a December year-end in China. Settlement of tax liability must be made within five months of the end of the fiscal year.

Due to the language barrier in non-English language-speaking countries, some details might have been missed. Generally, companies included in this study are allowed to choose their fiscal year-end except for those from China. Alternating the fiscal year-end usually requires a disclosure explaining the reason behind it. Moreover, filing taxes in the majority of the sample countries depends on the individual company's financial period.

To sum up, companies in the UK are expected to choose

March, while the US has no clear indicator as to which month would be dominant. A clear preference for June should be noted for Australian companies. China is expected to have most, if not all, companies using December as their financial year-end, which led to its exclusion from the sample. Finally, German and French companies are anticipated to have December as the most preferred year-end month. Information gathered in this part will be linked with the analysis of the results in various parts of the analysis part of the study.

Research Methodology and Methods
Data Sample

The first question of this research empirically examines the relationship between the choice of fiscal year-end and firm characteristics, firm size, industry, audit fees and age of the firm. The main source of data was generated from *Compustat* and provided through *Wharton Research Data Services*. Data for audit fees and year of incorporation was acquired from *DataStream*, as *Compustat* did not offer enough observations. The sample covers the fiscal year 2016, including companies with year-end dates between 30 June 2016 and 31 May 2017. The reason behind that is to have six or more months during the fiscal year from 2016. To tackle the issue with international diversity, the study includes firms residing in countries with major stock markets: the USA, UK, Japan, Australia, France and Germany. Originally, this study planned to include Chinese firms in the sample. However, after researching Chinese regulations, it was found that companies are generally required to close their books in December. For that reason, China was removed from the sample, as firms there have no choice of financial year-end, which opposes this study's objective and would bias the results towards December to a high degree. After deleting data with missing values, the sample consists of 12,502 observations.

The use of two different sources for data resulted in a loss in observations, lowering the observations count for audit fees and age tests to 1,034 and 4,585, respectively. Observations with values of zero in the firm-performance test were deleted, leaving 10,125 observations for that particular test.

Study Variables and Methods

Variables

Given the international drift towards December year-ends, the study's dependent variable (the choice of fiscal year-end) is divided into December and non-December for simplification. Fiscal year-end month is used to note the general statistical trends within different countries. For the independent variables, firm size is measured by its market capitalization (e.g. Huberman and Kandel, 1989; Smith and Pourciau, 1988). The choice of market capitalization instead of total assets is due to many companies having intangible assets that cannot be reported in their statements, which may lead to total assets being a poor proxy for firm size. Industries are classified according to their Standard Industrial Classification (SIC) codes, which can be seen in Table 1. Annual audit fees are used to test for firms' audit fees. The difference between firms' age of incorporation and the year 2016 represents the company-age characteristic used in this study. Finally, return on equity (RoE) is calculated by dividing the firm's net income over its total equity at the beginning of the year and it measures the profit/loss that the company earns/makes from the USD of each shareholders' equity. The financial leverage is computed by dividing the firm's total liabilities over its total ending equity.

Table 1

Industry groups based on firms' standard industrial classification (SIC) codes

SIC Code	Industry
0100 - 0999	Agriculture, Forestry and Fishing
1000 - 1499	Mining
1500 - 1799	Construction
2000 - 3999	Manufacturing
4000 - 4999	Transportation, Communications, Electric, Gas and Sanitary Service
5000 - 5199	Wholesale Trade
5200 - 5999	Retail Trade
6000 - 6799	Finance, Insurance and Real Estate
7000 - 8999	Services
9900 - 9999	Non-classifiable

Source: United States Department of Labour. https://www.osha.gov/pls/imis/sic_manual.html

The Chi-square statistic (χ^2) test is used for determining the presence of an association between the choice of financial year-end and firm size and industry. The study considers the condition required for a valid chi-square test as explained by McClave et al. (2005)[2]. We use a separate regression to examine companies' age, audit fees and performance. Discriminant analysis is also performed and its results are compared to those of the regressions. In this study, discriminant analysis is specifically used to increase the reliability of the results.

Research Methods

- Firm Size

Market capitalizations for the whole sample are sorted into deciles, the smallest firms being in decile 1, while the largest firms are in decile 10. First, a

distributional characteristic of market capitalization is tabulated for each country in the sample. Fiscal year-end months are used to spot any preferences in specific dates for each country according to their domestic regulations. Following that, the study employs a chi-square test to investigate the relationship between fiscal year-end (December *vs*. non-December) and firm size.

- Firm Industry

Sample companies are distributed among nine different industries using their SIC code[3.] For firms that could not be allocated to one of these industries, a tenth category is included that serves such a purpose and is excluded from the testing process. The whole sample is assigned to one of the ten categories and the results are used to determine any preferences in year-ends for specific industries. Similar to firm size, the chi-square statistic is used to examine the relationship between fiscal year-end (December *vs*. non-December) and SIC categories.

In both chi-square tests, a degree of significance of 5% is used. The equation for calculating chi-square (χ^2) is as follows:

$$(\chi)^2 = \sum_{i=1}^{n} \frac{(o_i - e_i)^2}{e_i} \qquad (1)$$

where

o_i: observed frequency for category i.
e_i: expected frequency for category i.
n : the number of categories.
Source: Anderson, et al. (2010).

The rejection statement for the null hypothesis is:
$\chi^2 > \chi^2\ \alpha$, where $\chi^2\ \alpha$ has a degree of freedom = (number of rows – 1) (number of columns – 1).

- Audit Fees

Like firm size, audit fees are distributed among deciles to inspect any trends between December and non-December

year-ends. This is done to the whole sample and not by country due to the lower sample size. To test the impact of audit fees on the choice of financial year-end, the following linear regression model is employed:

Financial year-end = $\alpha_0 + \alpha_1 audit\ fees + \varepsilon$ \qquad (2)

Financial year-end is represented by one if the firm has December as its fiscal year-end month, or zero otherwise. The audit fees variable represents the natural logarithm of one plus audit fees paid during the fiscal year 2016 for each firm. For the purpose of this study, the audit fees are measured in USD. Initially, the study planned to control for firm size, but as many previous studies expressed a correlation between audit fees and company size, the control variable was dropped, as it would cause multicollinearity issues. This model is used to test whether a correlation exists between audit fees and the choice of financial year-end. Further analysis to identify the month in which the highest audit fees are concentrated for each country could not be conducted, as the sample is relatively small to fulfil that purpose; the presence of one high audit fee observation would significantly bias the results of that month.

- Age

The sample is distributed among the age bracket of ten years, with each bracket stating the number of companies that follow a December or non-December year-end. Also, the number of companies moving from and to December for the same sample between the years 2012 and 2016 is inspected. The year 2012 is chosen as any prior year would have caused a significant loss of observations. To test the impact of company age on the choice of financial year-end, the following linear regression model is employed:

Financial year-end = $\alpha_0 + \alpha_1 company\ age + \alpha_2 size + \varepsilon$

\qquad (3)

Financial year-end is represented by one if the firm

has December as its fiscal year-end month, or zero otherwise. Company age is calculated by calculating the difference between the date of incorporation and 2016. Firm size is controlled for in this model, which equals the natural logarithm of one plus the market capitalization for a firm. As discussed previously, there may be other endogenous variables that could affect the choice of financial year-end, but are not controlled for in this study.

- Firm Performance

To test the relationship between firm performance and the choice of financial year-end, the following linear regression model is employed:

Financial year-end $= \alpha_0 + \alpha_1 RoE + \alpha_2 leverage + \varepsilon$ (4)

Financial year-end is represented by 1 if the firm has December as its fiscal year-end month, or zero otherwise. Return on equity (RoE) is a ratio of net income/loss over the book value of equity at the beginning of period (Damodaran, 2007). Leverage is proxied by debt-to-equity ratio (Smith & Pourciau, 1988), which is calculated by total liabilities over the ending book value of equity.

All regression models in this study are tested for any issues related to *heteroscedasticity* and *multicollinearity* to ensure a higher level of accuracy. Also, discriminant analysis is run for each of the variables using regression models as a supporting test to achieve results with higher reliability. These three models consider new areas that previous literature has not discussed in depth. Therefore, they are considered as the main contributions that this study is providing to the literature. These models may be improved and expanded to provide results with higher explanatory power.

Research Results
Distribution of the Financial Year-ends

Table 2 illustrates the distribution of financial year-ends in 2016 for each country. There are clear differences in the popularity of certain year-ends across countries. Most of the firms in France and Germany (88.8%), the US (76.2%) and UK (51.4%) seem to have December as their financial year-end month. However, Australian companies have a high year-end concentration in June (83.3%), while Japanese firms tend to choose March as their year-end date (72.5%). Globally, the choice of fiscal year-end between December and non-December appears to be almost balanced, totalling 51.6% and 48.4%, respectively. May is noted to be the least chosen closing month with only 0.3% in total. Figure 1 shows a brief plot of these percentages across the year. Compared to Kamp's (2002) study, where companies with December year-ends were significantly higher than their non-December counterparts, this study shows that December is starting to grow less 'popular' as a fiscal year-end month. However, Table 3 presents the number of companies that changed their financial year-ends during the period 2012 to 2016. The majority of these companies chose to change their fiscal year-end month to December, which is contradictory to the results obtained earlier that December is becoming less 'popular'. However, it must be noted that only 249 companies changed their year-end, which may not be enough to affect the results obtained before.

Table 2
Distribution of financial year-ends for 2016

Panel A: Financial year-end distribution across months per country												
Financial year-end	1	2	3	4	5	6	7	8	9	10	11	12	Total
USA	115	47	177	72	29	255	71	90	268	153	64	4,288	5,629
UK	43	27	177	17	0	160	35	32	117	24	26	696	1,354
Japan	37	131	2,045	27	5	61	14	41	90	30	44	295	2,820
Australia	2	2	22	3	0	1,340	13	4	19	1	0	203	1,609
France & Germany	2	4	18	0	0	25	2	10	50	7	4	968	1,090
Total	199	211	2,439	119	34	1,841	135	177	544	215	138	6,450	12,502

Panel B: Financial year-end distribution across months per country in percentage

Financial year-end	1	2	3	4	5	6	7	8	9	10	11	12	Total
USA	2.0%	0.8%	3.1%	1.3%	0.5%	4.5%	1.3%	1.6%	4.8%	2.7%	1.1%	76.2%	100%
UK	3.2%	2.0%	13.1%	1.3%	0.0%	11.8%	2.6%	2.4%	8.6%	1.8%	1.9%	51.4%	100%
Japan	1.3%	4.6%	72.5%	1.0%	0.2%	2.2%	0.5%	1.5%	3.2%	1.1%	1.6%	10.5%	100%
Australia	0.1%	0.1%	1.4%	0.2%	0.0%	83.3%	0.8%	0.2%	1.2%	0.1%	0.0%	12.6%	100%
France & Germany	0.2%	0.4%	1.7%	0.0%	0.0%	2.3%	0.2%	0.9%	4.6%	0.6%	0.4%	88.8%	100%
Total	1.6%	1.7%	19.5%	1.0%	0.3%	14.7%	1.1%	1.4%	4.4%	1.7%	1.1%	51.6%	100%

December	51.6%
Non-December	48.4%
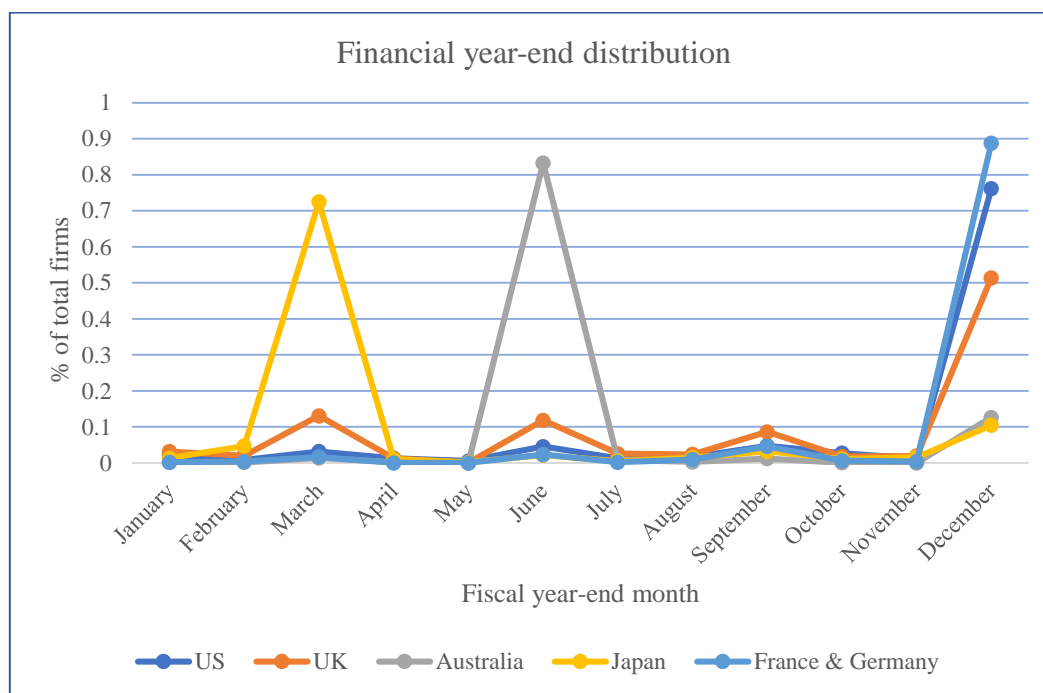
Figure (1)
Financial year-end distribution across countries by month for 2016

Table 3
Financial year-end changes between 2012 and 2016

Country	From December	To December	From/to non-December	Total
USA	7	50	7	64
UK	15	33	18	66
Australia	9	31	7	47
Japan	4	34	13	51
France	1	4	2	7
Germany	4	9	1	14
Total	40	161	48	249

To find out whether domestic regulations affect the choice of financial year-end, reporting requirements discussed previously are referred to here. Australia's mandatory tax year that ends on 30 June seems to

strongly influence the choice of firms' own financial year-end. This confirms the expected year-end month for Australian companies discussed earlier. The statistical distribution achieves comparable results to Lu et al. (2013), whose distribution showed that 84.1% (+0.8%) of Australian firms ended their financial year in June for the year 2010. Similarly, having a specific criterion for some Japanese firms to end their years on 31 March appears to significantly affect the choice of financial year-end. Kamp (2002) also showed a similar trend for financial year-end distributions in Australia and Japan as this study.

Although France and Germany do not mandate a specific year-end, having the calendar year as these countries' typical tax year appears to tip the choice of year-end towards December. Other factors may affect that; however, such as the choice of year-end in other European Union countries. As for the US and UK, typical government and tax year-ends do not seem to influence the choice of firms' year-end. In contrast to Kamp's (2002) sample from the year 1999, there is an increase of 22% and 32% in firms choosing December as their financial year-ends for the US and the UK, respectively. Therefore, it could be argued that domestic legislations have an influence on some countries, but not all. An expansion to the sample by including more firms from different countries for future research would help form

stronger arguments.

Firm Size

The results of firms' market capitalization distribution into deciles for each country are tabulated in Table 4, the smallest firms being in decile 1 and the largest in decile 10. Panel A shows the size distribution for US firms across the year. There is a consistent concentration in December year-end across firm sizes. The proportion of firms choosing December year-end to total firms in the corresponding decile appears to vary closely to 75%. Different results are noticed in panel B for UK firms, where the proportion of firms choosing December year-end in each decile varies from 36% in decile 5 to 64% in decile 2. Australian firms in panel C appear to drift away from a June year-end as they grow bigger in size. In total, 90% of firms in the lowest decile have June as their year-end, which drops to around 64% in the largest decile. Contrastingly, Japanese firms in panel D are more likely to choose March as their year-end as firms grow in size. Finally, French and German companies in panel E have little variation in the choice of the year-end month across different firm sizes.

Table 4
Distribution of financial year-ends against firm size for 2016

Financial year-end	1	2	3	4	5	6	7	8	9	10	11	12	Total
Panel A: Financial year-end distribution across months against market capitalization deciles for the USA													
Size decile													
0.1	4	5	3	0	0	33	3	7	22	2	0	289	368
0.2	3	6	3	0	0	27	2	1	19	11	6	310	388
0.3	4	2	10	2	1	22	4	5	27	6	9	305	397
0.4	11	2	12	5	1	29	7	7	20	13	8	375	490
0.5	6	5	14	5	5	22	5	11	24	18	10	376	501
0.6	9	0	26	8	5	23	11	5	24	22	10	413	556
0.7	15	10	19	18	7	28	11	16	25	33	7	468	657
0.8	15	5	27	18	1	22	10	13	20	12	7	547	697
0.9	19	2	27	11	2	24	11	15	40	19	3	603	776
1	29	10	36	5	7	25	7	10	47	17	4	602	799
Total	115	47	177	72	29	255	71	90	268	153	64	4,288	5,629
Panel B: Financial year-end distribution across months against market capitalization deciles for the UK													

Financial year-end	1	2	3	4	5	6	7	8	9	10	11	12	Total
Size decile													
0.1	0	3	10	0	0	40	2	7	17	5	2	102	188
0.2	6	2	12	1	0	15	4	2	14	2	2	107	167
0.3	7	4	11	2	0	17	4	0	10	2	5	72	134
0.4	3	3	21	1	0	18	6	3	8	4	4	67	138
0.5	5	5	28	1	0	17	7	3	13	2	2	58	141
0.6	7	3	21	1	0	20	5	6	20	4	6	52	145
0.7	5	4	13	3	0	9	1	7	9	1	2	73	127
0.8	3	1	28	3	0	14	3	2	15	4	1	54	128
0.9	4	0	17	4	0	6	2	1	7	0	1	57	99
1	3	2	16	1	0	4	1	1	4	0	1	54	87
Total	43	27	177	17	0	160	35	32	117	24	26	696	1,354

Panel C: Financial year-end distribution across months against market capitalization deciles for Australia

Financial year-end	1	2	3	4	5	6	7	8	9	10	11	12	Total
Size decile													
0.1	0	1	4	0	0	520	0	0	2	0	0	53	580
0.2	0	1	2	0	0	283	2	1	2	1	0	42	334
0.3	1	0	5	0	0	137	2	0	1	0	0	29	175
0.4	0	0	1	0	0	92	1	0	1	0	0	20	115
0.5	0	0	1	0	0	75	1	0	0	0	0	12	89
0.6	0	0	3	2	0	73	0	1	2	0	0	8	89
0.7	0	0	1	0	0	53	1	1	1	0	0	11	68
0.8	1	0	2	1	0	40	3	0	2	0	0	11	60
0.9	0	0	2	0	0	35	2	1	4	0	0	5	49
1	0	0	1	0	0	32	1	0	4	0	0	12	50
Total	2	2	22	3	0	1,340	13	4	19	1	0	203	1,609

Panel D: Financial year-end distribution across months against market capitalization deciles for Japan

Financial year-end	1	2	3	4	5	6	7	8	9	10	11	12	Total
Size decile													
0.1	1	0	16	0	0	3	0	0	1	0	1	6	28
0.2	4	10	134	2	0	8	3	4	15	3	6	26	215
0.3	10	25	276	7	0	12	4	10	13	3	7	42	409
0.4	4	14	280	4	0	13	2	6	14	6	11	36	390
0.5	1	14	288	8	1	7	0	7	17	9	6	43	401
0.6	8	13	266	2	3	6	2	3	11	2	6	38	360
0.7	0	14	234	1	0	3	1	4	8	3	2	30	300
0.8	4	24	222	1	0	5	2	5	7	1	3	17	291
0.9	4	7	183	2	0	2	0	1	3	3	0	30	235
1	1	10	146	0	1	2	0	1	1	0	2	27	191
Total	37	131	2,045	27	5	61	14	41	90	30	44	295	2,820

Panel E: Financial year-end distribution across months against market capitalization deciles for France and Germany

Size decile	1	2	3	4	5	6	7	8	9	10	11	12	Total
0.1	0	0	2	0	0	2	0	0	1	1	0	80	86
0.2	0	0	1	0	0	4	1	2	4	2	1	131	146
0.3	0	0	0	0	0	4	0	0	7	0	1	123	135
0.4	0	0	2	0	0	1	0	4	7	1	0	103	118
0.5	1	0	1	0	0	5	1	0	4	0	0	106	118
0.6	0	0	2	0	0	1	0	0	7	1	0	89	100
0.7	0	1	4	0	0	1	0	1	7	2	0	83	99
0.8	1	2	1	0	0	4	0	1	2	0	1	62	74
0.9	0	1	4	0	0	2	0	0	5	0	1	78	91
1	0	0	1	0	0	1	0	2	6	0	0	113	123
Total	2	4	18	0	0	25	2	10	50	7	4	968	1,090

The results for the chi-square test between the choice of fiscal year-end and firm size are shown in Table 5. The

actual observations show that smaller companies, from the first decile up to the sixth, are more likely to choose a non-December month to end their fiscal year. However, as companies increase in size, the number of firms choosing December is significantly higher. The test of association between the two variables results in the chi-square's summation being larger than the critical value of the chi-

square at a degree of freedom of nine and a significance level of 5%. Thus, the P-value is less than the significance level of 5%, which indicates that there is an association between the two variables. Therefore, the *null hypothesis of no association between the choice of financial year-end and firm size* can be rejected.

Table 5
Results of chi-square test – the choice of financial year-end vs. firm size

Actual observations (o_i)											
Size decile	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	Total
Financial year-end											
December	530	616	571	601	595	600	665	691	773	808	6,450
Non-December	720	634	679	650	655	650	586	559	477	442	6,052
Total	1,250	1,250	1,250	1,251	1,250	1,250	1,251	1,250	1,250	1,250	12,502
Expected observations (e_i)											
December	644.9	644.9	644.9	645.4	644.9	644.9	645.4	644.9	644.9	644.9	
Non-December	605.1	605.1	605.1	605.6	605.1	605.1	605.6	605.1	605.1	605.1	
(o_i) − (e_i)											
December	-114.9	-28.9	-73.9	-44.4	-49.9	-44.9	19.6	46.1	128.1	163.1	
Non-December	114.9	28.9	73.9	44.4	49.9	44.9	-19.6	-46.1	-128.1	-163.1	
($o_i − e_i$)^2											
December	13,201	835	5,461	1,972	2,490	2,016	384	2,126	16,410	26,603	
Non-December	13,201	835	5,461	1,972	2,490	2,016	384	2,126	16,410	26,603	
($o_i − e_i$)^2 / (e_i)											
December	20.47	1.29	8.47	3.06	3.86	3.13	0.59	3.30	25.45	41.25	
Non-December	21.82	1.38	9.02	3.26	4.11	3.33	0.63	3.51	27.12	43.96	
Chi-square	229			Critical value of chi-square				16.92			
Degree of freedom	9			P - value				0.000			

Firm Industry

As previously indicated, the classification of industries is tabulated in Table 1. A total of 58 companies did not have an industry classification; so, they were removed from the test sample. The results of the industry analysis are presented in Table 6. The agriculture, forestry and fishing industry tends to have a concentration in June and December year-ends. It is to be noted that only 45 companies were allocated to that industry, which may be a too small number to observe trends. A high concentration of December year-ends is noted in the manufacturing (48.1%), transportation, communications, electric, gas and sanitary service (57.4%), finance, insurance and real estate (65.3%) and services

industries (54.6%). The other frequent months for these industries are March and June. The retail-trade industry has the lowest concentration in the December year-end, with 73.3% of the firms choosing a variety of non-December year-ends and March rendering the highest non-December preference (22.5%). Firms choosing non-December year-ends are also noted to dominate those choosing December in the mining, construction and wholesale trade industries. The mining industry has a significant concentration in June (56.9%), while both the construction and wholesale trade's highest concentrations are in March, with 48.1% and 46.7%, respectively. Figure 2 summarizes

the distribution of financial year-ends (December *vs.* non-   December) among the industries (SIC codes).

Table 6
Distribution of financial year-ends against industries for 2016

Panel A: Financial year-end distribution across months against SIC codes

Financial year-end	1	2	3	4	5	6	7	8	9	10	11	12	Total
SIC code													
0100 - 0999	0	1	6	0	0	16	0	1	3	1	0	17	45
1000 - 1499	2	2	15	0	0	655	9	1	17	0	1	449	1,151
1500 - 1799	3	1	127	2	0	30	3	2	14	5	3	74	264
2000 - 3999	46	48	1,122	29	6	410	34	45	163	51	38	1,849	3,841
4000 - 4999	2	7	162	0	1	82	6	3	24	1	6	396	690
5000 - 5199	7	11	202	4	1	33	6	9	20	7	8	125	433
5200 - 5999	77	84	133	12	2	44	8	24	40	4	5	158	591
6000 - 6799	32	35	344	55	21	320	46	75	160	119	62	23,83	3,652
7000 - 8999	29	21	310	17	3	247	22	17	100	27	14	970	1,777
9900 - 9999	1	1	18	0	0	4	1	0	3	0	1	29	58
Total	199	211	2,439	119	34	1,841	135	177	544	215	138	6,450	12,502

Panel B: Financial year-end distribution across months against SIC codes in percentage

| Financial year-end	1	2	3	4	5	6	7	8	9	10	11	12	Total
SIC code													
0100 - 0999	0.0%	2.2%	13.3%	0.0%	0.0%	35.6%	0.0%	2.2%	6.7%	2.2%	0.0%	37.8%	100%
1000 - 1499	0.2%	0.2%	1.3%	0.0%	0.0%	56.9%	0.8%	0.1%	1.5%	0.0%	0.1%	39.0%	100%
1500 - 1799	1.1%	0.4%	48.1%	0.8%	0.0%	11.4%	1.1%	0.8%	5.3%	1.9%	1.1%	28.0%	100%
2000 - 3999	1.2%	1.2%	29.2%	0.8%	0.2%	10.7%	0.9%	1.2%	4.2%	1.3%	1.0%	48.1%	100%
4000 - 4999	0.3%	1.0%	23.5%	0.0%	0.1%	11.9%	0.9%	0.4%	3.5%	0.1%	0.9%	57.4%	100%
5000 - 5199	1.6%	2.5%	46.7%	0.9%	0.2%	7.6%	1.4%	2.1%	4.6%	1.6%	1.8%	28.9%	100%
5200 - 5999	13.0%	14.2%	22.5%	2.0%	0.3%	7.4%	1.4%	4.1%	6.8%	0.7%	0.8%	26.7%	100%
6000 - 6799	0.9%	1.0%	9.4%	1.5%	0.6%	8.8%	1.3%	2.1%	4.4%	3.3%	1.7%	65.3%	100%
7000 - 8999	1.6%	1.2%	17.4%	1.0%	0.2%	13.9%	1.2%	1.0%	5.6%	1.5%	0.8%	54.6%	100%
9900 - 9999	1.7%	1.7%	31.0%	0.0%	0.0%	6.9%	1.7%	0.0%	5.2%	0.0%	1.7%	50.0%	100%
Total	1.6%	1.7%	19.5%	1.0%	0.3%	14.7%	1.1%	1.4%	4.4%	1.7%	1.1%	51.6%	100%
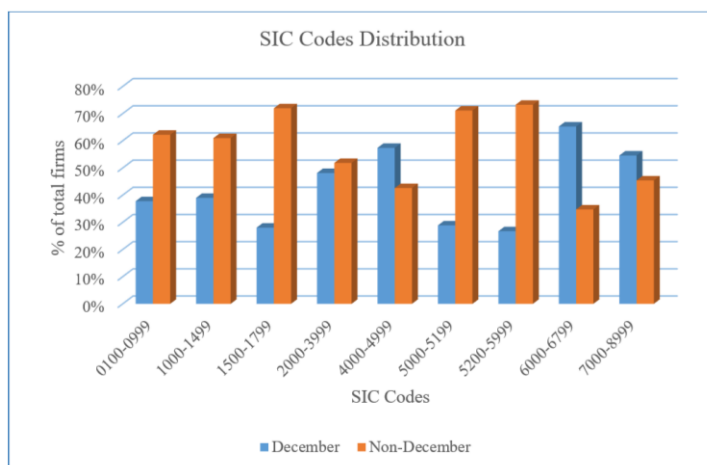
Figure (2)
Firms' distribution across industries

Table 7 shows the results for the chi-square test between the choice of financial year-end and industries. These results show a chi-square summation that is significantly higher than the critical value at a degree of freedom of 8 and a significance level of 5%. The almost zero P-value indicates that a relationship does exist between these two variables that is statistically significant at 5%. Accordingly, the *null hypothesis of no association between the two variables can be rejected*, leading to H2 being supported. This study's findings regarding the very high concentration of non-December year-ends in the retail industry are consistent with previous literature findings (Huberman and Kandel, 1989; Kamp, 2002; Smith and Pourciau, 1988). Moreover, similar results were concluded by Huberman and Kandel (1989) for the manufacturing, banking and transportation, communications, electric, gas and sanitary industries, with firms preferring a December year-end. On the other hand, their results noted a very high preference for December in the mining industry of 73%, whereas it drops to 39% according to this study's findings, with June having the highest percentage of 56.9%.

Table 7
Results of chi-square test – the choice of financial year-end vs. firm industry

Actual observations (o_i)										
SIC codes	0100 - 0999	1000 - 1499	1500 - 1799	2000 - 3999	4000 - 4999	5000 - 5199	5200 - 5999	6000 - 6799	7000 - 8999	Total
Financial year-end										
December	17	449	74	1,849	396	125	158	2,383	970	6,421
Non-December	28	702	190	1,992	294	308	433	1,269	807	6,023
Total	45	1,151	264	3,841	690	433	591	3,652	1,777	12,444
Expected observations (e_i)										
December	23.2	593.9	136.2	1,981.9	356.0	223.4	305.0	1,884.4	916.9	
Non-December	21.8	557.1	127.8	1,859.1	334.0	209.6	286.0	1,767.6	860.1	
$(o_i) - (e_i)$										
December	-6.2	-144.9	-62.2	-132.9	40.0	-98.4	-147.0	498.6	53.1	
Non-December	6.2	144.9	62.2	132.9	-40.0	98.4	147.0	-498.6	-53.1	
$(o_i - e_i)^2$										
December	39	20,998	3,872	17,669	1,597	9,687	21,595	248,600	2,818	
Non-December	39	20,998	3,872	17,669	1,597	9,687	21,595	248,600	2,818	
$(o_i - e_i)^2 / (e_i)$										
December	1.67	35.36	28.42	8.91	4.49	43.36	70.81	131.93	3.07	
Non-December	1.78	37.69	30.30	9.50	4.78	46.22	75.49	140.64	3.28	
Chi-square	678		Critical value of chi-square				15.507			
Degree of freedom	8		P - value				0.000			

Audit Fees

Figure 3 presents the distribution of firms' financial year-end (December *vs.* non-December) among audit fee deciles. There is a slight trend noticed which is an increase in December year-end firms as audit fees go up in price. This may create a motive for companies to avoid having a December year-end, as higher audit fees may apply around that month. This study explores audit-fee trends for each country and compares these to respective domestic legislation. However, due to limitations in sample size, this could not be done if accurate results were to be concluded. One firm with very high audit fees that has a specific year-end month would bias the results for that month to a high degree. Future research with a bigger sample size can explore this area, especially as this study summarizes domestic legislations for the
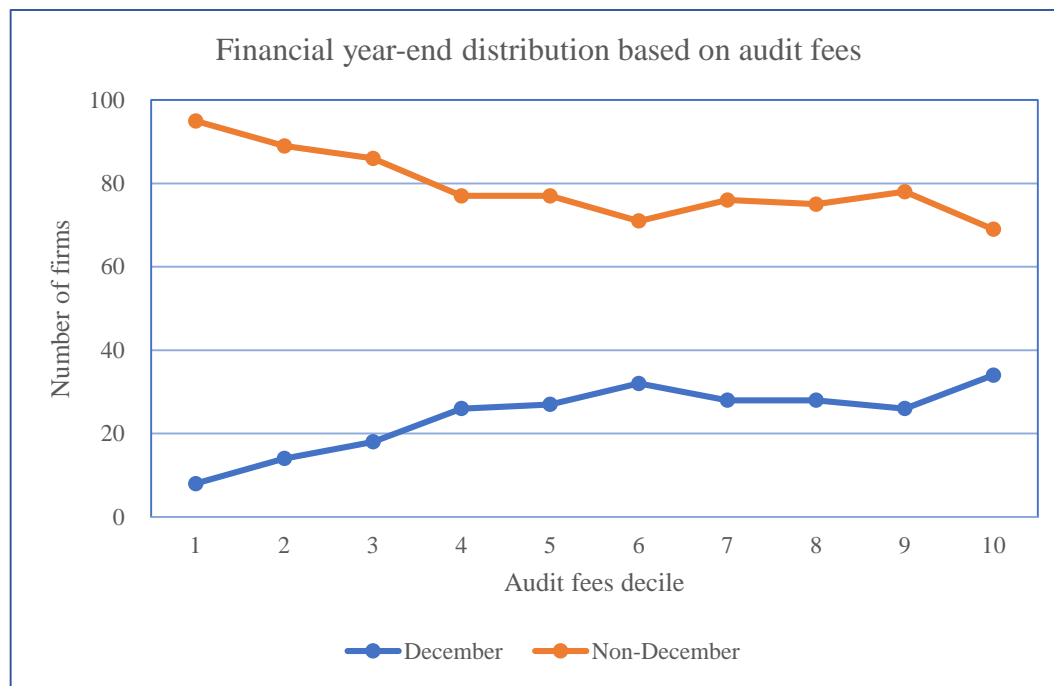
countries included in the sample.

Figure (3)
Financial year-end distribution across audit fees

The results for probit regression between the choice of financial year-end and audit fees are tabulated in panel A of Table 8. Although the explanatory power of the model (R^2) is low, an association between the two variables is noted to be statistically significant at 1% level of significance. The low R^2 may be caused by a high number of observations in the test. The coefficient's sign is positive, meaning that firms with higher audit fees are more likely to choose December year-ends. This supports the trend found and discussed above about Figure 3. Wald chi-square also shows a statistically significant association between the two variables. Panel B shows the discriminant-analysis test performed to enhance the reliability of the probit regression's results. Similarly, the two variables have an association that is statistically significant under 1% in this test, as well. The F-statistic acquired (22.07) suggests that these two variables are not weak instruments, as it is higher than the general rule of thumb value of 10 (Staiger and Stock, 1997). Overall, these results support H3. That is, there is a correlation between audit fees and the choice of financial year-end (December *vs.* non-December).

Table 8
Test of H3

Panel A: Probit-regression results	
Financial year-end = $\alpha_0 + \alpha_1 audit\ fees + \varepsilon$	
Variable(s)	Financial year-end
Audit fees	0.1476***
	(0.0000)
Constant	-2.7955
Observations	1,034
R^2	0.0199
Wald chi2	24.61
Prob > chi2	0.0000
Panel B: Discriminant-analysis results	
Variable(s)	Financial year-end
Audit fees	1***
Observations	1,034
Likelihood ratio	0.9791
F-stat	22.07
Prob > F	0.0000

Note: This table reports the regression results for the tests of the impact of audit fees on the choice of financial year-end (December *vs.* non-December). The sample period is 2016. Panel A represents the probit regression. The P-values are in parentheses, with *, **, *** denoting the statistical significance at 10%, 5% and 1%, respectively. Panel B shows the discriminant-analysis results.

Age

Table 9 shows the number of companies that choose December *vs.* non-December financial year-ends based on their age. Companies with up to 50 years of age are found to be more likely to choose December than non-December. However, companies aged from 50 to 130 years seem to prefer non-December year-ends. For companies older than 130 years, the sample is not big enough to conclude a trend from it. These results partially support the fourth hypothesis of this study, which will be discussed in more details below.

Table 9
Financial year-end distribution according to firm age

Age	December	Non-December	Total
0-10	414	312	726
11-20	848	619	1,467
21-30	558	392	950
31-40	290	231	521
41-50	123	116	239
51-60	70	79	149
61-70	74	95	169
71-80	15	37	52
81-90	37	48	85
91-100	24	44	68
101-110	24	26	50
111-120	18	28	46
121-130	12	24	36
131-140	7	5	12

141-150	6	1	7
151-160	2	1	3
161-170	1	1	2
171-180	1	0	1
181-190	1	0	1
191-200	1	0	1
Total	2,526	2,059	4,585

The probit-regression results are found in panel A of Table 10. Similar to the previous regression results, R^2 is low, but this may also be due to the big sample size used. Both age and size are statistically significant at a 1% level of significance when associated with the choice of financial year-end (P-value = 0.0000). The negative sign of the age's coefficient indicates that companies are less likely to choose December as they grow older in age, which supports the statement made in the previous paragraph. Conversely, the positive sign of the control variable, firm size, suggests that companies are more likely to choose December as they grow bigger in size, which also supports the chi-square results

previously discussed regarding the association between firm size and the choice of financial year-end. Wald chi-square results seem to show an association between the variables that is statistically significant. The discriminant-analysis test provides equivalent results with same coefficient signs and an association that is significant under 1%. The F-statistic is higher than the 10 rule of thumb, which gives more weight to the test's results. All these results are in favour of H4, showing that *older (newer) firms tend to choose non-December (December) year-ends*.

Table 10
Test of H4

Panel A: Probit-regression results	
Financial year-end = $\alpha_0 + \alpha_1 age + \alpha_2 size + \varepsilon$	
Variable(s)	Financial year-end
Age	-0.0063***
	(0.0000)
Size	0.0803***
	(0.0000)
Constant	-1.1945
Observations	4,585
R^2	0.0242
Wald chi2	141.06
Prob > chi2	0.0000
Panel B: Discriminant-analysis results	
Variable(s)	Financial year-end
Age	-0.7267***
Size	0.9078***
Observations	4,585
Likelihood ratio	0.9671
F-stat	77.897
Prob > F	0.0000

Note: This table reports the regression results for the tests of the impact of firm age on the choice of financial year-end (December *vs.* non-December) after controlling for company size. The sample period is 2016. Panel A represents the probit regression. The P-values are in parentheses, with *, **, *** denoting the statistical significance at 10%, 5% and 1%, respectively. Panel B shows the discriminant-analysis results.

Firm Performance

Finally, Table 11 tabulates the results for the impact of firm performance, measured by RoE, on the choice of financial year-end after controlling for leverage. Cases of extreme outliers were noted, which were caused by cases of very high net income (loss) with low beginning equity for RoE or very high liabilities with low ending equity for leverage. These cases were winsorized at 2% to remove these outliers and reduce skewness. Panel A describes the probit-regression results. The explanatory power (R^2) for this model is fairly weak, being only 0.0012. RoE is noted to have an association with the choice of financial year-end that is statistically significant under 5%. The sign suggests that firms with better firm performance are less likely to have December as their financial year-end. The control variable, leverage, is also statistically significant, but under 1%, with a positive sign, indicating that firms with higher leverage are more likely to have December as their financial year-end month. The supporting discriminant analysis test in panel B also provides identical results that are statistically significant under 1% with similar coefficient signs as the probit regression. The F-statistic is lower than the 10 rule of thumb, which indicates that the variables used may be considered as weak instruments. Overall, these results support this study's H5b, stating that *an association exists between financial year-end and firm performance*.

Table 11
Test of H5

Panel A: Probit-regression results	
Financial year-end = $\alpha_0 + \alpha_1 RoE + \alpha_2 leverage + \varepsilon$	
Variable(s)	Financial year-end
RoE	-0.0467**
	(0.019)
Leverage	0.0137***
	(0.001)
Constant	-0.1232
Observations	10,125
R^2	0.0012
Wald chi2	16.10
Prob > chi2	0.0003
Panel B: Discriminant-analysis results	
Variable(s)	Financial year-end
RoE	-0.5839***
Leverage	0.8274***
Observations	10,125
Likelihood ratio	0.9984
F-stat	8.2634
Prob > F	0.0003

Note: This table reports the regression results for the tests of the impact of firm performance on the choice of financial year-end (December *vs.* non-December) after controlling for company leverage. The sample period is 2016. Panel A represents the probit regression. The P-values are in parentheses, with *, **, *** denoting the statistical significance at 10%, 5% and 1%, respectively. Panel B shows the discriminant-analysis results.

All the results seem to show a relationship between the various variables used in this study and the choice of financial year-end. There are many suggestions and conclusions that can be formed by these results, which will be discussed in the next part of study. It is to be noted that all models applied in this research are considered as a starting point for further research. The results acquired indicate that the choice of financial year-end does matter and that it can have many implications on accounting theory and practice. This area of research has not been given fair consideration by previous literature and has also been ignored when it should not have been when used to restrict a sample.

Discussion and Conclusions

This paper sought to assess the importance of the choice of financial year-end and how it can affect accounting research and practice. This was done by examining the relationship between specific firm characteristics (size, industry, audit fees and age) and the choice of financial year-end after accounting for international diversity and domestic regulations. The research also formed a model to test how firm performance might be related to the manager's year-end choice. The results indicate an association between each individual variable and financial year-end. Although some had weak explanatory power, these models are a good starting point for deeper, more detailed research that can generate more powerful results. Some of these associations were expected, as a few researchers found a correlation between various firm characteristics and the choice of fiscal year-end (see, Huberman and Kandel, 1989; Smith and Pourciau, 1988; Kamp, 2002; Lu et al. 2013).

The sample is extracted from Compustat and DataStream and it includes 12,502 observations from six countries: US, UK, Japan, Australia, France and Germany. The distribution of financial year-ends for the companies show that December is preferred for US, UK, France and Germany, while Japan and Australia prefer March and June, respectively. Both the US and UK's domestic regulations have no effect on their

firms' choice of financial year-end, while having the calendar year as the government's financial year for France and Germany, may be behind those companies' preference for December. Similarly, Australian and Japanese regulations may be behind those companies' preference for year-end dates. The Japanese standard setters believe that accounting is a contributor to the national economy (Walton et al., 1998) and that could explain why Japanese companies tend to unite in their choice of financial year-end. Generally, December is becoming less popular when compared to Kamp's (2002) study, which included a sample for the year 1999.

Firstly, the study explores the relationship between firm size and the choice of financial year-end. When compared to previous-literature findings (i.e., Huberman and Kandel, 1989; Smith and Pourciau, 1988), this study's findings indicate similar results for the effect of firm size on the choice of financial year-end. However, this conclusion contradicts Kamp's (2002) findings for firm size after controlling for international diversity. His sample was more diversified than this study's, including 13 countries compared to just six in this research. The general trend shows a tendency towards December year-end as firm size grows bigger. However, when explored individually, countries seem to have different trends. For example, Japanese companies tend to be less likely to choose March as their year-end as they grow bigger in size, while Australian companies have the completely opposite trend.

This association could be explained by the difficult process of changing the year-end for bigger companies, as it would be a timely and costly process due to the more complex structure and the presence of numerous shareholders. Smaller companies, on the other hand, may find it feasible to experiment with different year-ends around the year to find out which month makes the business most efficient. Moreover, having the calendar year as the typical or 'traditional'

year-end may make bigger companies stick to it to improve comparability. If one big company decides to have a non-December year-end, investors may be hesitant to invest in that company, as it would be harder to compare its results with those of other companies.

The presence of a relationship between firm size and the choice of fiscal year-end is very important to accounting research and practice. Existing studies that restricted their samples to firms with specific year-ends (see Ball and Brown, 1968; Lipe, 1986; Rayburn, 1986) may have also indirectly limited the samples to companies with larger or smaller sizes, which may lead to biased conclusions. As for practice, the choice of financial year-end may be one way by which comparability can be enhanced. If a trend in a specific year-end for type of firms is widely noted, following that trend may lead to better financial reporting comparability which benefits investors and managers alike, as higher comparability can enhance internal and external decisions. However, further research that is explicitly focused on comparability and the choice of financial year-end should be conducted to confirm that argument. This could also be linked to the results of the industry variable which is discussed next.

Secondly, the study examines the link between firm industry and the choice of fiscal year-end. Testing results show a statistically significant relationship between the two variables here as well. Non-December preference is noted in the retail industry, which follows the conclusion of existing literature (Huberman and Kandel, 1989; Kamp, 2002; Smith and Pourciau, 1988). On the other hand, firms with a higher preference for December year-end are found in the manufacturing, banking and transportation, communications, electric, gas and sanitary industries, aligning with Huberman and Kandel's (1989) conclusion. Smith and Pourciau (1988) found that regulated or recently deregulated industries tend to have firms with preference to the calendar year-end. This study does not test that statement due to the limitation in resources and time. Further research is suggested to dig deeper into this area to support the literature claim.

Comparability here can also be considered, with a link to business seasonality to a certain degree. Lu et al. (2013) stated that financial year-end concentrations in industries may be due to seasonality of business in that sector. Huberman and Kandel (1989) suggested that for industries with seasonal activities, firms choose their fiscal year-ends at the time when their inventories are lowest. Therefore, if one firm decides not to follow the industry's trend for year-end choice, it may possibly cause comparability issues. Companies from the same sector will probably have a similar inventory direction when the business is seasonal. When a company decides to choose a different year-end (i.e., when inventory is high instead of low or *vice versa*), comparing the company's financials to those of other companies may impose a challenge. The retail sector is an example of a seasonal industry, but the results show no high preference in a particular month. This may indicate a current comparability issue in the season sectors of the retail industries. The results also affect the accounting theory in the same way in which firm size does. That is, the composition of a sample may be significantly affected by a restriction in the financial year-end, which agrees with Smith and Pourciau's (1988) conclusion.

Thirdly, audit fees are examined to see whether they are associated with a financial year-end. Huberman and Kandel (1989) explained how having a concentration in a specific year-end increases the demand of audit services around that date, which in turn increases audit fees charged in that period. Although the sample for audit fees is limited, it is noted that the ratio of December firms to non-December firms slightly increases as audit fees increase. Testing results show an association that is statistically significant. It should be noted that this is not enough to prove that audit fees around a specific year-end are higher. The study's sample includes different countries that do not have matching 'trending' year-ends. That

is, Australia may have higher audit fees around the June period, but only December *vs.* non-December year-ends are tested in this study. This is another area that future research could cover, as a relationship is generally noted in the paper's results.

Fourthly, company age is tested for a relationship with the choice of financial year-end. No previous literature discussed this variable before. Testing results show an association between the variables that is statistically significant. The expectations built in this study's fourth hypothesis are met, which state that older (newer) firms are expected to prefer non-December (December) year-ends. This could be due to firms following the traditional trend of a December year-end. Also, this could be a hint that picking a non-December year-end may have more advantages than a December one, given that firms with higher experience in the market tend to choose a non-December date. This is too general of a statement; however, various determinants are present when deciding the choice of year-end, as seen from the results so far.

Finally, the effect of firm performance on the choice of financial year-end is explored. This is another new area that this paper is contributing to in the literature. The results show that a relationship does exist between the two variables. Specifically, the study focuses on interlinking firm performance with management incentives, as managers have the ability to practice earning-management techniques and to choose the financial year-end for their firms. It is noted that firms with better firm performance are less likely to have December as their financial year-end. This is driven by Oyer's (1998) conclusion which states that managers may time their firms' revenues to maximize their benefits. These results give a hint that earning management may be linked with the choice of financial year-end, which invites many areas that can be further researched in the future.

To sum up, the financial year-end is usually not given enough attention, although it could correlate with many current accounting issues. The findings indicate that the

choice of financial year-end can have implications that affect both the theoretical and practical sides of accounting. It is a critical issue that should be addressed more often by regulators, whether on a domestic or an international level. The study shows that comparability is found to be related to the choice of financial year-end. The IASB and FASB list comparability is one of the main characteristics considered in their conceptual frameworks, yet no guidance is provided when it comes to the choice of year-end. All the results lead to one main conclusion: the choice of financial year-end *does* matter and should be addressed more often in future research.

For future studies, it is suggested that the independent variable should be used to include all calendar months, not only December *vs.* non-December. This can help address the issue more deeply, in more detail and in different contexts. Moreover, the models used in this study can be expanded to attain results that are more accurate, by researching suitable control variables or supporting statistical methods. Furthermore, the study suggests increasing sample size and retesting where the sample size was affected in this study, such as in audit fees and firm age variables. Finally, the study's results can be assessed by repeating previous literature's tests that limited their sample based on financial year-end using a sample that does not have that limitation and then comparing both results.

Nonetheless, this research is not without limitations. Perhaps the most important one is the limitation in previous literature, especially when it comes to forming the testing models. Where new models were introduced in this study, the results could not be compared to those of any previous work due to their inexistence. Finally, the sample size for audit fees and firm age was very limited compared to the original sample due to unavailability of data in a single database.

NOTES

[1] China was originally considered in this paper, but after researching its domestic regulations, it was noted that companies there are forced to choose December as a year-end. This led to Chinese companies being removed from the sample, as they have no 'choice' over their financial year-end, which opposes this study's direction.

[2] Two main conditions have to be fulfilled: (i) the observed counts are a random sample from the population; and (ii) the sample count is large enough, so that for every cell the expected count should be equal to five or more.

[3] Check Table 1.

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