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The puzzle of internal audit function budget toward specialist auditor choice and audit fees

Does family ownership matter? Malaysian evidence

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Abstract

Purpose – This study is motivated by the lack of internal audit function (IAF) research and by the call for research on the impact of dominant owners such as family shareholders on audit fees and the demand for audit quality. This study aims to examine the impact of the IAF budget on the selection of industry-specialist auditors and on audit fees, particularly in companies with family-controlled shareholders, a feature unique to Malaysia.

Design/methodology/approach – Data of Malaysian-listed companies during the period 2009-2012 are used. To examine the relationships, logit and ordinary least square regressions are used. Several additional analyses are conducted to assess the robustness of the main results, including alternative measures of specialist auditor and family ownership, endogeneity problems and self-selection bias.

Findings – The results show that the IAF budget is positively related to hiring industry-specialist auditors and audit fees. However, family companies are less likely to support the positive association between IAF costs and engage specialist auditors than non-family companies. In addition, a complementary association between the costs of IAF and audit fees for both family and non-family companies was found. Finally, the results show that there is a negative association between family ownership and the ratio of IAF costs to audit fees, suggesting that family companies rely more upon external auditing than internal auditing.

Originality/value – The contribution of this study is to provide an empirical evidence about the tradeoff between IAF and both industry-specialist auditors and audit fees with considering the moderating impact of family-ownership shareholdings. This issue is yet to be examined, and it provides implications for policymakers and practitioners, as it offers insights into the importance of investing in IAF toward hiring industry-specialist auditors and pricing the audit services.

Keywords Malaysia, Audit fees, Family ownership, Internal audit function budget, Specialist auditor

Paper type Research paper



1. Introduction

Recently, there has been a phenomenal growth in accounting research examining family firms, in which family members hold positions in top management, sit on the board or are

major shareholders. This is not surprising, as family firms control around 70 to 80 per cent of the global gross domestic product (Bardhan *et al.*, 2015). For example, in the USA, they account for approximately 35 to 46 per cent of Standard and Poor's (S&P) 500 (1500) and 10 per cent of the total market capitalization (Anderson and Reeb, 2003; Srinidhi *et al.*, 2014). In North America and Western Europe, Chrisman *et al.* (2010) report that founding families constitute more than 80 per cent of the market capitalization. In Asia, family business is the backbone of these economies (Khan *et al.*, 2015). Firms in East Asian countries are usually dominated by families and the state (La Porta *et al.*, 1998; Claessens *et al.*, 2000; Claessens and Yurtoglu, 2013). Claessens *et al.* (2000) reported that families control around 60 per cent of the top management of concentrated firms, and more than half of the East Asian firms are extensively controlled by families. In particular, family businesses in Malaysia comprise 49 per cent of the total market capitalization (Khan *et al.*, 2015).

Traditionally, the transactions between owners and managers can induce agency problems, called Type I agency problems, as a result of the separation of ownership and management common in firms with diffuse ownership structure (non-family firms). However, firms with ownership concentrated in the hands of a few individuals (family members) experience Type II agency problems due to conflicts of interest between the majority insider shareholders and minority shareholders (Villalonga and Amit, 2006). The controlling position of a major owner could be used to extract hihe/ser private benefits at the expense of the minor owner[1]. It is suggested that the demand for audit quality is driven by increasing the Type I agency problem (between owners and managers) (DeFond, 1992; DeFond and Zhang, 2014). With fewer Type I agency problems (i.e. family firms), companies might have less incentive to employ a higher-quality auditor so as to pay lower audit fees (Ho and Kang, 2013). However, increasing information asymmetry between majority and minority shareholders may encourage the majority shareholders to employ a high-quality auditor to signal their credible financial reporting (Fan and Wong, 2005; Wang *et al.*, 2008; Kang, 2014). In addition, the existence of expropriation of the interests of minority shareholders in family firms could lead to increase the audit risk (Khan *et al.*, 2015). Thus, more extensive efforts would be needed by auditors to mitigate such risks, resulting in their charging higher audit fees. In sum, two competing views might explain the demand for audit quality in family firms. The demand for audit quality could be lower in family firms because they are subject to less severe Type I agency problems (Kang, 2014). However, increasing the Type II agency problems and expropriation of minority owners in family firms could lead to an increase in the demand for high-quality auditors (Fan and Wong, 2005). The existence of these competing views makes the demand for audit quality in family firms a potentially fruitful area.

Governance literature has focused on the effectiveness of the board of directors and audit committee in decreasing Types I and II agency problems, while the role of an internal audit function (IAF) is rarely examined. DeFond and Zhang (2014) state that research on IAF is still in its infancy. The scarcity of archival studies on IAF could be attributed to limited publicly available data on it (Abbott *et al.*, 2016). Gramling *et al.* (2004) and Christopher *et al.* (2009) document that the Sarbanes-Oxley Act of 2002 (SOX) does not precisely address IAF, and that IAF did not receive as much attention as that given to audit committees and external auditors. IAF remains a neglected area of research (Roussy, 2015; Roussy and Brivot, 2016; Mihret and Grant, 2017). An important review of archival auditing research by DeFond and Zhang (2014) calls for future research to answer the interesting question whether IAF substitutes or complements the external audit function and how the auditee's competencies related to IAF help fulfill the demand for audit quality. Future research is also called for by Hay *et al.* (2008) to examine proxies for IAF to enrich the literature by providing

clearer explanations of the role of IAF. Hay (2013) and Hay *et al.*, (2006) document that the evidence is limited as to how the different ownership structures could impact audit quality, particularly audit fees, and need additional research.

Following these research calls, this paper examines the effect of the IAF budget on auditor choice and audit fees in family firms in Malaysia. It focuses on Malaysia as an interesting case that needs more research for several reasons. First, as a developing economy, Malaysia is characterized by high ownership concentration, where a small group of related parties control and manage firms. Claessens *et al.* (2000) state that two-thirds of companies in East Asian countries are controlled by a single shareholder and more than half controlled by a family. About 97 per cent of the Malaysian-listed companies have substantial family shareholders, with 33 per cent of the family members involved in management (PricewaterhouseCoopers, 1998). Type I agency problems occur less in family firms, leading to less demand for high audit quality (Kang, 2014). However, presence of the Type II agency problem could result in a higher demand for high-quality auditors (Fan and Wong, 2005; Kang, 2014). In sum, competing views predict the demand for audit quality in family firms. However, Khan *et al.* (2015) argue that the demand for audit quality in one developing country, Bangladesh, is low because of the dominance of the expropriation effect on alignment. Therefore, explaining how different conflicts of interest in the Malaysian context affect auditor choice and audit fees will enrich the extant auditing literature.

Secondly, unlike the USA and UK, the cost of IAF is disclosed in the annual reports of Malaysian-listed companies. The Malaysian regulators look more carefully at the role of IAF in the process of financial reporting and corporate governance. Bursa Malaysia mandated all listed companies to establish the IAF in the revised code 2007 (part 2, section BB-VII). In January 2008, the Listing Requirements Bursa Malaysia (LRBM) (Chapter 9 Appendix 9C Part A) mandated all listed companies to disclose the costs incurred for the IAF. Johl *et al.* (2013) mention that the LRBM focused on a number of IAF reforms such as the head of the IAF has to report directly to the audit committee, and the audit committees is responsible to review the adequacy and competence of the IAF. DeFond and Zhang (2014) considered examining the IAF on audit quality as a fruitful area needing further research. Thus, the publicly available data of the IAF could open another path to enrich the auditing literature by understanding the impact of auditees' IAF costs on the demand for audit quality.

Thirdly, the level of audit fees in Malaysia is low compared to other countries in the region, which may influence the audit quality (Lee and Azham, 2008). The former executive chairman of the Audit Oversight Board (AOB), Nik Mohamed Hasyudeen Yusoff, stated that Malaysian companies should consider of audit fees as being an investment rather than an expenditure, and they should consider the auditors as supporters to enhance the value of companies rather than only their costs (The Star, 2011). The occurrence of such considerations by Malaysian companies in audit fees adds an interesting dimension to this paper. Therefore, Malaysian regulators and policymakers need to determine the factors that may affect the audit fees and audit quality in Malaysia.

Using a sample of 544 Malaysian-listed companies and 2,176 observations for the period 2009 to 2012, this study finds that, in family companies, there is an insignificant association between investment in the IAF and engaging specialist auditors; however, non-family companies invest more in the IAF and hire specialist auditors. In addition, family companies prefer to invest more in external auditing (audit fees) than the IAF, depending more on external auditing and less on the IAF. These findings suggest that, in a context characterized by concentration of ownership, there is greater reliance on external auditing on account of the internal auditing service. The main findings remain valid through several

additional tests, including alternative measures of specialist auditor and family ownership, endogeneity problems and self-selection bias.

To the best of the researchers' knowledge, the current paper is the first study to explore the impact of the IAF budget on auditor choice and audit fees. It contributes to the literature of audit selection and audit fees by considering the IAF cost effects within family- and non-family-listed companies in Bursa Malaysia. The results provide evidence of a positive association between the IAF budget and hiring specialist auditors in non-family companies compared with family companies, suggesting that, in non-family companies, a complementary association between the investment in the IAF and demand for audit quality (hiring specialist auditor) is clearer than in family-controlled companies. However, family and non-family companies invest in both the IAF and external auditing, and a positive relationship between the IAF costs and audit fees is found in both types of firms.

Inspired by the study of [Anderson *et al.* \(1993\)](#), this paper also explores the impact of family ownership on the substitutions or tradeoffs between investment in the IAF and external auditing. It is one of the few studies to examine the tradeoffs between investment in the IAF and external auditing (audit fees) and the first to explore this association in family companies. Inconsistent with our prediction that a greater proportion of family ownership leads to a greater reliance on the IAF and less on external auditing, the findings show that family firms prefer to invest more in external auditing, paying larger audit fees than in the IAF. This might reflect the high level of Type II agency problems in family-controlling shareholders and signal their non-expropriation by demanding extensive audit services (higher audit quality). [Fan and Wong \(2005\)](#) argue that the major shareholders could signal their non-expropriation by demanding high-quality auditors.

The next section presents the related literature and hypothesis development used in this study. Section 3 details the research design, including the sample selection, models and measurement of variables. Section 4 provides the empirical findings. The final section presents the conclusions.

2. Literature and hypothesis development

2.1 Literature

2.1.1 Auditor choice. [Watts and Zimmerman \(1983\)](#) argue that the classic agency problem (conflicts of interest between agents and owners) is the main driver of the demand for audit quality. In addition, the demand for an independent auditor is driven by information asymmetry, which is an expected output of the separation of ownership between shareholders and managers ([Watts and Zimmerman, 1983](#)). Thus, the extent of information asymmetry and conflicts of interest could determine the type of audit quality demanded by firms' management.

In contrast is the context where concentrated ownership is common, and few individuals, typically family members, control the corporation. The Type I agency problem is less of an issue for family companies, where family members may be part of the company's management, which is consistent with the prediction of the agency theory that having managers who are the owners of the company could mitigate the classic agency problem ([Jensen and Meckling, 1976](#)). [Demsetz and Lehn \(1985\)](#) document that there are economic incentives for controlled shareholders to reduce agency conflicts and maximize company value. [Niskanen *et al.* \(2010\)](#) justify the fewer conflicts of interest in family companies by the controlling family members concentrating more on the long-term survival and reputation of their company, creating a state of trust and confidence in other stakeholders. This situation leads to fewer conflicts of interest and information asymmetry between agents and principals, resulting in less demand for audit quality. However, the presence of controlling

shareholders might produce conflict between large and small major and minor shareholders, where the controlling family shareholders could become entrenched in the family company and expropriate the interests of minority shareholders, the Type II agency problem. This entrenchment problem could come at a price for major shareholders and their companies, so may be an incentive for the major shareholders to engage higher-quality auditors to signal non-expropriation behavior and add more credibility to financial reporting (Ho and Kang, 2013). Abbott and Parker (2000) argue that hiring credible auditors could signal the quality of managers' representations about financial performance. Fan and Wong (2005) find that the Big 4 audit firms are more likely to be appointed in companies that have more entrenchment problems, suggesting that the controlling owners are signaling to the minority shareholders that their interests are well monitored and protected.

In sum, the extant literature provides two competing views: the presence of controlling shareholders could either mitigate Type I agency problems which leads to reduce the demand for audit quality or exacerbate Type II agency problems which increasing the demand for audit quality. Audits performed by industry-specialist audit firms are likely to be of a higher quality, for the expertise possessed by the audit team. It is argued that an audit service provided by a specialist auditor is likely to be of a high quality, as the specialist auditor has more accurate and error-free knowledge (Solomon *et al.*, 1999). This provides more assurance that breaches in financial statements will be detected (DeFond, 1992), offering superior competency and good reputation (DeFond and Zhang, 2014). Most previous studies have focused on the impact of auditees' characteristics (e.g. size, profitability, operational complexity, risk) on their auditor choice. Some studies also see the characteristics of boards of directors and audit committees as drivers for auditor selection. For example, Abbott and Parker (2000) state that, with a strong governance structure, firms are more likely to demand a high audit quality; they investigate the impact of the independence and number of meetings of audit committees, concluding that, with a higher percentage of non-executive directors and number of meetings, the auditee tends to hire specialist auditors. Beasley and Petroni (2001) find that companies with more independent directors are more likely to hire a specialist brand-name auditor. Chen *et al.* (2005) examine whether the audit committee characteristics (non-executive directors, expertise and number of meetings) could explain the differentiated demands for audit quality in the top 510 Australian-listed companies in 1998. Their findings show that a more independent audit committee is significantly and positively associated with using specialist auditors.

The above studies on auditor choice have been conducted in Type I agency problems, largely in the USA and Australia. However, there is a recent wave by audit researchers in examining the determinants of auditor selection in concentrated ownership contexts, where the Type II agency problem is common. For example, Ho and Kang (2013) explore the auditor selection and audit fees in family companies from S&P's 1,500 companies. They conclude that family companies are less likely to engage top-tier audit firms and pay lower audit fees compared to non-family companies. However, Kang (2014) finds that family firms are more likely to signal the quality of financial reporting by hiring specialist audit firms in US family companies. Srinidhi *et al.* (2014) investigate the role of board of directors' effectiveness on auditor selection in US family companies, showing that family companies that hold effective board control are more likely to hire specialist auditors than non-family companies. These findings support the argument that an effective governance structure could mitigate the conflicts of interest between majority and minority shareholders in family companies. In fact, all the papers discussed previously were conducted in US family companies with Type II agency problems, which is an exception to the fact that the general context of agency problems in the USA is Type I. One exception is the study by Khan *et al.*

(2015) on the Bangladeshi audit market; they investigate the impact of family ownership on auditor selection and audit fees for listed companies in Bangladesh. Their findings indicate that Bangladeshi family companies hire lower-quality auditors and pay lower audit fees than non-family companies. However, family companies appoint specialist auditors and pay higher fees than non-family companies in the export-oriented industry sector. Thus, exploring auditor selection in developing economies such as Malaysia, where the dominance of family members is common, could provide insights and enrich the audit and family-firm literature.

Along with recent attention to auditor selection in family businesses, this study extends the area by exploring the impact of the IAF budget on auditor choice in family-owned publicly listed companies in Bursa Malaysia. Since 2001, the emphasis on the IAF has increased, and particularly after the company scandals (e.g. Enron and WorldCom), regulators have emphasized the importance of the presence of an IAF (Carcello *et al.*, 2005)[2]. Despite the increased attention of regulators to the IAF, research is limited, and investment in the IAF is considered less than the relationship of the existence of the IAF to accounting outcomes. Abbott *et al.* (2016); DeFond and Zhang (2014); Hay *et al.* (2008); Zain *et al.* (2006) document that there is little archival research on the contribution of the IAF to external auditing because of unavailable data of the IAF[3]. So, Malaysian-listed companies mandated by the LRBM to disclose the costs of the IAF may well provide fruitful ways for exploring auditor selection. Sherer and Kent (1983) argue that managers use the IAF as a bonding cost borne to satisfy the demands of owners for accountability and to signal to companies' owners that their interests are well monitored. Johl *et al.* (2013) argue that the greater the investment in the IAF, the greater the monitoring role of the IAF in financial reporting. Prawitt *et al.* (2009) conclude that, if the IAF is well funded, it can increase the ability to detect companies' management bias or constrain their opportunistic behavior. Therefore, more investment in the IAF is likely to improve the quality of the IAF and cover a greater scope of audit work. A company's management usually has the direct decision of how much to invest in the IAF. Independent members of both the board of directors and audit committee may be likely to exercise some pressure on the IAF implementation (Hay *et al.*, 2008). The Securities and Exchange Commission (SEC) stressed the key role of audit committees in monitoring financial reporting systems, ensuring the quality of financial reporting and relying extensively on internal and external auditing.

There are alternative arguments to explain the association between IAF and external auditing: one is the complementary argument which suggests that better IAF leads to supplementary external auditing, so internal and external auditing complement each other (Hay *et al.*, 2008). Hence, more investment in the IAF may lead to demand for a high level of audit quality, and a positive association between the IAF budget and audit quality would be expected. A counter-argument is the substitution argument, which suggests that superior internal audit will reduce the need for extensive external auditing and vice versa. Thus, monitoring mechanisms could substitute each other, and a negative relationship among monitoring mechanisms is predicted. These scenarios may occur under normal situations with dispersed ownership (non-family firms) and the board of directors and audit committee free from the pressure of controlling shareholders to perform their duties and monitoring role to the maximum. Ho and Kang (2013) argue that, in family companies, controlling family shareholders could indirectly affect some decisions regarding the amount of investment in external auditing and auditor selection, which are considered as the core work of the board of directors and audit committee[4]. In addition, the controlling shareholders do not typically rely as much on the governance mechanisms to monitor managers because of

their presence within the management and their direct monitoring on managers (Desender *et al.*, 2013).

2.1.2 *Audit fees.* Audit fees have been examined in previous studies from two perspectives. First is the supply-side perspective that the auditee's characteristics (size, complexity and risk) affect the extent of the auditor's work and effort, and in turn, the level of audit fees (Simunic, 1980). The auditors may charge higher fees for a larger auditee, riskier auditee or when the audit is more complex. Further, audit firms have to extend their coverage and hours of work, and employ specifically qualified staff, in industries that are prone to high litigation risk (Simunic and Stein, 1996). Simunic and Stein (1996) also indicate that with high-liability exposure situations, the auditors will make upward fee adjustments through more audit efforts than a pure price premium. Audit market concentration also plays an important role in audit fees. Huang *et al.* (2016) provide supporting evidence that audit market concentration could enhance the quality of the auditee's earnings and reduce the issuing of a modified audit opinion by auditors through increased audit fees. Their results show that audit concentration is related positively to audit fees in China. The workload of audit firms might increase with the introduction of corporate governance codes. Tsui *et al.* (2001) investigate the impact of board independence of its chief executive officer on the audit fees. They conclude that a negative association between independent boards and audit fees suggests that companies with independent corporate boards could signal holding an effective monitoring mechanism that leads to decreasing control risk, resulting in lower audit fees. In the same way, Bedard and Johnstone (2004) find that more independent and expert directors on the audit committee may reduce the auditor's workload, resulting in lower audit fees. Another important variable examined in previous studies is the ownership structure. Jensen and Meckling (1976) argue that the conflict of interest between a company's managers and owners could be aligned, particularly when managers have a shared interest in their companies. It is suggested that the greater the managerial ownership, the lower the agency costs expected (Jensen and Meckling, 1976). Managers with a high proportion of shares are less likely to manipulate earnings or mislead investors, increasing the reliability of financial information and accounting data (Mitra *et al.*, 2007). Further, managerial shareholders could employ talented and qualified directors who might perform for the overall well-being of the company. Thus, in such a low-risk situation, the audit firm could reduce the amount of premium risk and level of audit coverage and efforts, reducing the audit fees. Chan *et al.* (1993) and Mitra *et al.* (2007) support this argument; their findings indicate that there is a negative association between managerial ownership and audit fees. In the same way, family companies have fewer Type I agency problems and fewer incentives to manipulate earnings and distort accruals because of serving in senior managerial positions. Kane and Velury (2004) argue that more insider ownership mitigates audit risk and reduces the probability of class-action lawsuits. So, from the supply side, audit firms may need to perform less auditing, resulting in charging lower audit fees.

In terms of the IAF, few studies have investigated the association between IAF and audit fees, and their findings are mixed. Wallace (1984) finds that the IAF could act as a substitute mechanism for external auditing, resulting in a negative association between the IAF expenditure and audit fees. This negative association could be attributed to lower assessment of audit risk by audit firms, while more investment in the IAF might signal stronger internal control, giving greater reliability to financial information and reducing the work and hours of the auditors. Evidence is provided by Felix, Gramling and Maletta (2001) on the contribution of the IAF on audit fees, where it is an important determinant of audit fees. However, a significant positive association between the ratio of the client's IAF costs and auditor's remuneration suggests a complementary relation rather than a substitute. A

non-significant relationship between the IAF contribution and audit fees is reported (Chung and Lindsay, 1988; Stein *et al.*, 1994; Carey *et al.*, 2000). Thus, the mixed evidence on whether the IAF is a key deterrent for external auditors in assessment of the inherent risks of the audit, and thereby the audit fees, requires further research.

The second perspective in the audit fees literature is the demand side. DeFond and Zhang (2014) characterize the demand side of audit as a function of the auditee's incentives and competencies, which refers to the ability of auditees to obtain a particular level of audit quality. In other words, audit fees in the demand side are used to examine whether corporate governance mechanism competencies are related to audit quality. The demand-side factors receive less attention in the traditional literature compared with the supply-side factors, but this focus shifted after the SOX interventions, and the demand-side research is considered as one of the fastest growing areas (DeFond and Zhang, 2014). Previous studies provide strong proof that companies with a good corporate governance structure are more likely to demand higher audit quality, resulting in higher audit fees. For example, companies with an effective board of directors and audit committee demand intensive audit services, and hence pay higher fees (Abbott Parker *et al.*, 2003; Carcello *et al.*, 2002; Engel *et al.*, 2010; O'Sullivan, 2000; Hay *et al.*, 2008). In line with the findings of earlier studies, more investment in the IAF might increase the demand for higher audit quality. However, little is known about the impact of investment in the IAF, whether it impairs or improves the audit quality (DeFond and Zhang, 2014).

It is argued that the greater the level of managerial ownership, the more closely the interests between managers and outside shareholders and the lower the audit quality (DeFond, 1992). Managers with greater ownership have less incentive to provide misdirected information. Thus, the demand for intensive audit services could be less with more insider ownership. Mitra *et al.* (2007) and O'Sullivan (2000) support this prediction by reporting a negative association between insider ownership and the demand for audit quality. Similarly, Ali *et al.*, (2007) argue that evaluating managerial performance in family companies depends less on accounting reports; where family members have senior managerial positions, other managers have less incentive or ability to manipulate accruals (Srinidhi *et al.*, 2014). Thus, the managers of these companies will demand less extensive auditing because they provide higher financial security. Ho and Kang (2013) find that family companies in the USA demand less extensive external auditing and pay lower audit fees due to the alignment effect. Khan *et al.* (2015) find that family companies pay significantly lower audit fees and choose lower-quality auditors than do non-family companies. However, family companies with strong board governance hire specialist auditors and demand extensive audit services in the form of paying higher audit fees than do family companies with weak board governance (Srinidhi *et al.*, 2014).

2.2 Hypothesis development

2.2.1 Association between investment in IAF and auditor choice in family and non-family companies. The presence the two competing views of the relationship between the IAF and demand for specialist auditors, in addition to the difference in severity of Type I and II agency problems, creates more ambiguity in this area that has been never touched. Therefore, this paper takes the initiative to discover and remove this ambiguity by investigating the relationship between the IAF budget and hiring of specialist auditors in East Asian countries, particularly Malaysia. The ownership of companies in East Asian economies is more concentrated, where a few individuals (family members) control and dominate the major decisions of these companies (Fan and Wong, 2005). Therefore, non-family companies with Type I agency problems could support the complementary views,

suggesting that greater investment in the IAF could lead to hiring a specialist auditor[5]. Prior studies (Abbott and Parker, 2000; Hay et al., 2008; Srinidhi et al., 2014) provide strong evidence for the complementary notion that companies with strong corporate governance are more likely to hire higher-quality auditors, but most of these studies were conducted in a Western context where the Type I agency problem is common.

However, family companies with less traditional agency problems could negatively affect the demand for monitoring mechanisms such as the IAF and external auditing. It is argued that existence majority shareholders largely affect the business decisions of firms' managers in East Asian countries (Johnson et al., 2000). Regarding the view of alignment interests between managers and shareholders in family firms, controlled-family firms may have less incentive to monitor managers because controlling family shareholders can easily and directly monitor managers. Therefore, family firms may invest less in internal governance mechanisms such as internal auditing. In terms of expropriation view, family controlling shareholders with an intention to expropriate the minority shareholders' wealth have an incentive to limit the monitoring role of governance mechanisms. Thus, the family controlling shareholders will appoint unskilled directors, invest less in the IAF and hire low-quality auditors. However, family controlling shareholders may tend to demand higher audit quality by hiring a specialist auditor to gain the trust of minority shareholders and give them a signal that your interests are well monitored. Fan and Wong (2005) provide supporting evidence to this argument, where they find that companies in East Asian countries (Hong Kong, Indonesia, Malaysia, Philippines, Singapore, South Korea, Taiwan and Thailand) hire Big 4 auditors to signal their non-expropriation behavior when Type II agency problems are embedded in the ownership structure. Therefore, with the competing arguments presented above, the following hypothesis is predicted:

- H1. The complementary effect between the investment in the IAF and demand for specialist auditors is a more dominant effect than the substitution effect in non-family firms than in family firms.

2.2.2 Association between investment in IAF and audit fees in family and non-family firms.

From the supply side, auditees with more investment in the IAF could signal holding good internal control and provide reliable financial information that reduces audit firms' assessment of audit risk. Thus, external auditors could reduce their work and audit hours, allowing them to decrease costly substantive testing. Therefore, a negative association between the IAF and audit fee is predicted. Family companies have less Type I agency problems and more alignment of interests between managers and owners, so family controlling shareholders have less incentives to monitor managers and to demand effective monitoring mechanisms. The last argument is based the following reasons. Firstly, family firms' managers have less opportunities to manipulate earnings, where family controlling shareholders can effectively and directly monitor managerial behaviors and actions (Jaggi et al., 2009). Also, in family firms, the interests of family shareholders are more closely aligned with the firms' interests so the earnings are less likely to be manipulated (Jaggi et al., 2009; Tosi and Gomez-Mejia, 1989). However, a Type II agency problem is a common feature of family companies, where family major shareholders may expropriate the wealth of minority shareholders. Therefore, family controlling firms may demand and invest less in internal governance mechanisms such as the IAF. Thus, low investment in the IAF may increase company risk and audit risk to limit the monitoring role of governance mechanisms. Therefore, auditors will charge higher audit fees to compensate the audit risk related with family firms with low investment in the IAF.

From the demand side, researchers find strong evidence that companies with good governance mechanisms demand higher-quality audit (DeFond and Zhang, 2014). Thus, the IAF might complement external auditing, resulting in more investment in both the IAF and external auditing which is common in diffuse ownership setting (non-family firms). Nevertheless, companies with family members in senior managerial positions can effectively control the behaviors of managers. Furthermore, companies dominated by family members are more likely to be related to lower demand for monitoring, either internal or external auditing. However, Fan and Wong (2005) argue that external auditors can perform a role of corporate governance in East Asian countries. They find that companies with concentrated ownership are more likely to hire Big 4 audit firms. Therefore, from the demand perspective, the positive and negative associations between investment in the IAF and audit fees are predicted in family companies.

Therefore, from the above discussions, the following hypothesis is formulated:

H2. An association between the investment in the IAF and audit fees is affected by the company structure (family or non-family).

2.2.3 Tradeoff between internal and external auditing in family companies. The hypothesis whether family companies rely more on the IAF than external auditing, or vice versa, is explored here; as explained earlier, companies where family members have senior managerial positions face less severe Type I but more severe Type II agency problems. Founding families can effectively and directly control and monitor the behavior of managers (Ali *et al.*, 2007). Thus, the opportunistic behavior of managers in family companies may be less than in non-family companies, due to the direct monitoring of family members. Shleifer and Vishny (1997) argue that concentrated ownership creates more incentives for monitoring. However, the interests of the controlling family are considered in making decisions, which may diverge from the minority owners' interests (Morck and Yeung, 2003). Controlling-family involvement in management and value control may lead to poor company performance (Crocchi *et al.*, 2012). Thus, larger family shareholders are likely to affect the level and structure of monitoring systems made in their interest. In family companies, there may be more uncertainty about the company value and its monitoring system. Family companies may prefer the IAF over external auditing because it is under their control. In these circumstances, family companies rely more on the IAF and less on external auditing, investing more in the former at the expense of the latter. This leads to *H3*:

H3. Family companies rely more on the IAF and less on external auditing.

3. Research design

3.1 Data and sample

The sample consists of companies listed on Bursa Malaysia from 2009 to 2012. As financial companies are subject to more regulation than other companies and have different characteristics of corporate governance, the sample is restricted to non-financial companies. The sample period starts in 2009 because all Malaysian-listed companies were mandated by the LRBM to disclose the costs of the IAF in their annual reports from 2008. The listed companies could not comply immediately with new regulation, so 2009 was chosen to maximize the sample by including the companies that disclosed their IAF costs. The financial data are obtained from the DataStream database. Family ownership, audit fees, cost of the IAF and board and audit committee

characteristics are collected manually from the annual reports of companies, obtained from Bursa Malaysia. After deletion of companies with missing data and delisted companies, the final sample comprises 2,176 company-year observations. The number of family company-years in our sample is 1,405 observations, with 771 observations for non-family company-years (Table 1).

3.2 Model specification

Following previous studies (Khan *et al.*, 2015; Srinidhi *et al.*, 2014), $H1$ is tested to identify the effect of the IAF budget on the choice of auditor, using following pooled logistic regression:

$$\begin{aligned} \text{AUDITSPEC} = & \beta_0 + \beta_1 \text{IAFBUDG} + \beta_2 \text{OUTOW} + \beta_3 \text{BODEFF} + \beta_4 \text{ACEFF} \\ & + \beta_5 \text{SIZE} + \beta_6 \text{COMPL} + \beta_7 \text{RISK} + \beta_8 \text{LEV} + \beta_9 \text{ROA} \\ & + \beta_{10} \text{AGE} + \beta_{11} \text{AOB} + \text{YEARDUM} + \text{INDUSRYDUM} + \varepsilon \end{aligned} \quad (1)$$

The dependent variable AUDITSPEC is one of three proxies for industry-specialist auditors, audit fees, auditee size and number of auditees, to derive the market share of each auditor (Audoussot-Coulier *et al.*, 2015)[6]. An audit firm is classified as an industry specialist if it has at least 10 per cent market share of the industry's total audit fees, total assets and number of auditees[7].

To test $H2$, that audit fees are related to the IAF costs, this study follows earlier research (Carcello *et al.*, 2002; Khan *et al.*, 2015; Srinidhi *et al.*, 2014), using the following pooled cross-sectional ordinary least square (OLS) regression:

$$\begin{aligned} \text{AUDITFEES} = & \beta_0 + \beta_1 \text{IAFBUDG} + \beta_2 \text{OUTOW} + \beta_3 \text{BODEFF} + \beta_4 \text{ACEFF} \\ & + \beta_5 \text{SIZE} + \beta_6 \text{COMPL} + \beta_7 \text{RISK} + \beta_8 \text{LEV} + \beta_9 \text{ROA} \\ & + \beta_{10} \text{AGE} + \beta_{11} \text{AOB} + \beta_{12} \text{BIG4} + \text{YEARDUM} \\ & + \text{INDUSRYDUM} + \varepsilon \end{aligned} \quad (2)$$

The dependent variable AUDITFEES is the natural log of audit fees (Carcello *et al.*, 2002; Khan *et al.*, 2015; Srinidhi *et al.*, 2014).

The independent variable IAFBUDG in Models 1 and 2 is the annual budget of the IAF, as the natural log of the IAF costs (Al-Rassas and Kamardin, 2016). For the full sample, an indicator variable FAMOW is included, which equals 1 if a company is a family company and 0 otherwise. This study classifies a company as family if there is a substantial family shareholding of 30 per cent or more (either direct or indirect) of total company-issued shares (Jaggi *et al.*, 2009) and at least one member of the family

Listed companies in 2009	958
Incomplete data and delisted companies	(377)
Financial companies	(37)
Total non-financial companies duration of the study	5,444
The observations in the sample from 2009 to 2012	2,176

Table I.
Sample selection

holds a managerial position, such as board member, CEO or chairman (Cascino *et al.*, 2010; Khan *et al.*, 2015). Models 1 and 2 are run for both family and non-family subsamples to test *H1* and *H2*, respectively.

Following the study of Anderson *et al.* (1993) to test *H3* whether family companies rely more (less) upon the IAF and less (more) upon external auditing by using the following OLS model:

$$\begin{aligned} \text{IAFAUDFEES} = & \beta_0 + \beta_1 \text{FAMOW} + \beta_2 \text{OUTOW} + \beta_3 \text{BODEFF} + \beta_4 \text{ACEFF} \\ & + \beta_5 \text{SIZE} + \beta_6 \text{COMPL} + \beta_7 \text{RISK} + \beta_8 \text{LEV} + \beta_9 \text{ROA} \\ & + \beta_{10} \text{AGE} + \beta_{11} \text{AOB} + \beta_{12} \text{BIG4} + \text{YEARDUM} \\ & + \text{INDUSRYDUM} + \varepsilon \end{aligned} \quad (3)$$

The dependent variable IAFAUDFEES is a ratio of the IAF budget to audit fees as a proxy for substitution of the IAF to external auditing. FAMOW is included as an indicator variable, which equals 1 if a company is a family company and 0 otherwise.

3.3 Control variables

Following the literature, control variables are derived by capturing other characteristics of companies that could affect the auditor choice and audit fees. The models are controlled by including companies' corporate governance characteristics (board of directors BODEFF and audit committee ACEFF characteristics) and outsider major shareholders OUTOW. Previous studies provide strong evidence that, with good governance mechanisms, companies are more likely to select higher-specialist auditors and pay higher fees (Abbott and Parker, 2000; Abbott *et al.*, 2003; Carcello *et al.*, 2002; Engel *et al.*, 2010; Hay *et al.*, 2008; O'Sullivan, 2000). Thus, BODEFF and ACEFF are measured by calculating the aggregate measure of four characteristics (size, independence, number of meetings and expertise) of both the board of directors and audit committee (Al-Jaifi *et al.*, 2017; Al-Qadasi and Abidin, 2018; DeFond *et al.*, 2005; Hashim and Amrah, 2016 [8]). The outside major shareholders, specifically institutional shareholders, are considered as active monitoring mechanisms (Kane and Velury, 2004). Beasley and Salterio (2001) argue that blockholders could be alternative monitoring mechanisms for the audit function, therefore decreasing the demand for audit quality. Thus, the models control for OUTOW which is measured by taking the percentage share of institutional and individual substantial shareholders who holds 5 per cent or more of a company's shares (Mittra *et al.*, 2007)[9]. Previous studies (Abbott and Parker, 2000; Abbott *et al.*, 2003; Carcello *et al.*, 2002) have shown that the size of a company, SIZE, is related positively with the demand for a higher auditor quality and audit fees; thus, SIZE is measured by taking the natural log of the total assets. Hay *et al.* (2008) argue that companies with more business and geographical segments are more complex and riskier than other companies. Auditees with more subsidiaries are likely to demand specialist auditors and pay higher audit fees. Thus, auditee complexity is measured by taking the natural logarithm of the number of subsidiaries (Hay *et al.*, 2008; Simunic, 1980). The risk of the auditee, RISK, is controlled following the suggestion that some balance sheets components (i.e. inventories and accounts receivable) are considered as riskier to audit, resulting in paying more audit fees and demanding a higher auditor quality (Hay *et al.*, 2008; Simunic, 1980). The ratio of the assumed inventories and accounts receivable to the total assets is calculated to measure RISK.

Lin and Liu (2009) argue that companies with high leverage may tend to demand high-quality auditors to alleviate doubt in the market of company performance and reduce their capital costs. A higher audit quality is demanded by US firms that experience increases in leverage (DeFond and Zhang, 2014). Simunic (1980) states that the leverage indicates the risk of auditees' failing, which potentially exposes the auditor to loss, resulting in higher fees charged by audit firms. Thus, leverage (LEV) is measured by the ratio of total debts to total assets. The profitability of auditees (ROA) is controlled following the argument that audit firms could be exposed to loss if an auditee is not financially viable (Simunic, 1980). A high-profitability auditee is more likely to engage a high-quality auditor to testify its performance to the market. Therefore, ROA is measured by the ratio of return on assets. Following the argument that regulatory intervention can change incentives of audit firms to supply high audit quality and auditees' incentives to demand high audit quality (DeFond and Zhang, 2014), this study controls the regulatory intervention by including the AOB as a regulatory body to control the auditors of Malaysian-listed companies. AOB is measured as a binary variable 1 for a company that issued its annual reports after AOB's establishment, and 0 before AOB's establishment. Auditee age (AGE) is controlled by taking the number of years a company has been on Bursa Malaysia. This study also includes auditor size, BIG4, to control the size of the audit firm in the audit fees model, based on prior studies (Craswell and Francis, 1999; Carcello *et al.*, 2002). It has been suggested that the audit firm's size can impact audit fees, whereas the Big 4 audit firms have a reputation and qualified staff that enable them to charge premium fees (Craswell and Francis, 1999). Table II presents the definitions of all variables.

4. Empirical results

4.1 Descriptive statistics and correlation matrix

The descriptive statistics for the variables are summarized in Table III for the full sample and sub-samples of family and non-family companies in Bursa Malaysia. The mean (median) values of AUDITFEES for the full sample are Malaysian Ringgit (RM) 276,270 (122,000), while the average for family and non-family are RM207,430 and RM401,719 respectively, indicating that AUDITFEES is significantly higher (by 100 per cent, with $p < 0.000$) for non-family companies. Compared to family companies, non-family company means are higher in terms of the ratio of the IAF costs to audit fees (IAFAUDFEES), indicating that family companies invest more in external auditing than internal auditing. Further, the mean (median) values of IAFBUDG for the full sample are RM329,587 (60,000), while the average for family companies is significantly lower than for non-family companies, at RM657,987 and RM149,376 respectively, with significant t -statistics of average differences. As shown in Table III, the number of family company-years in our sample is 1,405 observations, with 771 observations for non-family company-years. The descriptive statistics also show that the average values of BODEFF and ACEFF in family companies are lower than for non-family companies, which is in line with the results reported by Ho and Kang (2013). In addition, compared to non-family companies, family companies on average are smaller in terms of SIZE, COMPL and AGE and have lower RISK, LEV and ROA ratios.

The Pearson correlation matrix is presented in Table IV to test the correlation between the main variables. The reported correlation coefficients between the main variables are not greater than the 0.80 threshold, indicating the non-existence of multicollinearity problems (Gujarati, 2009). Additionally, untabulated findings of all variance inflation factors are within normal levels.

<i>AUDITSPEC</i>	Industry-specialist auditors dummy, a value of "1" is given if a company hires specialist audit firm, and "0" otherwise
<i>AUDITFEES</i>	Audit fees, natural log of audit fees
<i>IАFAUDFEES</i>	Ratio of IAF's costs to total audit fees
<i>IАFBUDG</i>	IAF's budget, natural log of the annual costs of internal audit function
<i>FAMOW</i>	Family ownership dummy, a value of "1" is signed if the company classified as a family company, and "0" otherwise
<i>IАFFOW</i>	Interaction variable between IAF's budget (IАFBUDG) and family ownership (FAMOW)
<i>OUTOW</i>	Percentage of shares held by substantial outsider shareholders who hold 5 per cent or more shares of company's shares
<i>BODEFF</i>	Board of director effectiveness, an aggregate measure of four BOD's characteristics (BODSIZE, BODIND, BODMEET and BODEXP), ranges from 0 to 4, with 0 indicating four highest and 0 lowest BODEFF
<i>BODSIZE</i>	Board size, a value of "1" is signed if the BODSIZE (number of board members) of a company is above the sample median, and "0" otherwise
<i>BODIND</i>	Board independence, a value of "1" is given if the BODIND ratio (the ratio of independent member in the board) of a company is greater than the median of sample, and "0" otherwise
<i>BODMEET</i>	Board meetings, a value of "1" is given if the BODMEET (the number of board meetings) of a company is above the sample median, and "0" otherwise
<i>BODEXP</i>	Board expertise, a value of "1" is signed if the BODEXP ratio (the ratio of the board members with financial expertise in board) of a company is greater than the median of sample, and "0" otherwise
<i>ACEFF</i>	Audit committee effectiveness, a composite measure of four AC's characteristics (ACSIZE, ACIND, ACMEET and ACEXP), ranges from 0 to 4 with 0 indicating four highest and 0 lowest ACEFF
<i>ACSIZE</i>	Audit committee size, a value of "1" is signed if the ACSIZE (the number of audit committee members) of a company is above the sample median, and "0" otherwise
<i>ACIND</i>	Audit committee independence, a value of "1" is given if the all audit committee members are independent, and "0" otherwise
<i>ACMEET</i>	Audit committee meetings, a value of "1" is given if the ACMEET (the number of audit committee meetings) of a company is above the sample median, and "0" otherwise
<i>ACEXP</i>	Audit committee, a value of "1" is signed if the ACEXP ratio (the ratio of the audit committee members with financial expertise in audit committee) of a company is greater than the median of sample, and "0" otherwise
<i>SIZE</i>	Company size, natural log of total assets
<i>COMPL</i>	Company complexity, natural log of subsidiaries
<i>RISK</i>	Company risk, the proportion of the sum of accounts receivable and inventories to total assets
<i>LEV</i>	The leverage, the percentage of total debts to total assets
<i>ROA</i>	The percentage of return on total assets
<i>AOB</i>	AOB establishment, dummy variable a value of "1" is given if a company issued its financial statement after AOB establishment, and "0" otherwise
<i>AGE</i>	Company age
<i>BIG4</i>	Audit type, dummy variable a value of "1" is given if a company is audited by one of Big 4 audit firms (Ernst and Young, Deloitte and Touche, KPMG and PriceWaterhouseCoopers, and "0" otherwise
<i>INDDUMS</i>	Industry dummies
<i>YEARDUMS</i>	Year dummies 2010-2012
<i>IАFSOUR</i>	IAF sourcing arrangement dummy, a value of "1" is given if a company established in-house, and "0" otherwise
<i>MILLS</i>	Invers mills ratio which is obtained from the probit model of BIG4

Table II.

Variables definitions

Variables	All	Mean		F	Median		SD		p25		p75		t-statistics of mean
		NF	All		All	All	All	All					
<i>AUDITFEES(RM'000)</i>	276,270	401,719	122,000	207,430	917,343	77,000	234,046	3,657***					
<i>IATAUDFEES (%)</i>	0.895	1.201	0.535	0.728	1.202	0.298	1,007	8,924***					
<i>AUDITFEES (Log)</i>	2,150	2,215	2,086	2,114	0.410	1,886	2,369	5,145***					
<i>IAPBUDG (RM'000)</i>	329,587	657,987	60,000	149,376	1642,697	30,000	180,000	5,218***					
<i>IAPBUDG (Log)</i>	1,899	2,058	1,778	1,811	0.600	1,477	2,255	8,524***					
<i>FAMOW</i>	0.646	-	1,000	-	0.478	0.000	1,000	-					
<i>OUTOW (%)</i>	17,203	36,203	7,960	6,776	22,784	0.000	25,125	29,038***					
<i>BODEFF</i>	1,562	1,805	2,000	1,428	0.936	1,000	2,000	8,777***					
<i>ACEFF</i>	1,432	1,503	1,000	1,392	0.879	1,000	2,000	2,792***					
<i>SIZE (RM'000)</i>	1,583,080,000	2,632,074,000	280,000,000	1,007,440,000	5,938,734,000	117,800,500	809,813,000	5,015***					
<i>SIZE (Log)</i>	5,510	5,598	5,447	5,462	0.676	5,071	5,908	4,133***					
<i>COMPL</i>	16,052	19,217	8,000	14,316	31,115	4,000	16,000	3,090***					
<i>COMPL(Log)</i>	0.788	0.821	0.903	0.769	0.991	0.602	1,204	1,134					
<i>RISK</i>	0.320	0.301	0.301	0.330	0.200	0.167	0.438	-3,074					
<i>LEV</i>	0.188	0.195	0.154	0.183	0.172	0.036	0.294	1,497					
<i>ROA</i>	0.0422	0.041	0.041	0.043	0.138	0.013	0.080	-0,284					
<i>AOB</i>	0.706	0.712	1,000	0.703	0.456	0.000	1,000	0.435					
<i>AGE</i>	13,949	15,446	13,949	13,128	7,119	7,789	18,234	7,251***					
<i>BIG4</i>	0.526	0.559	1,000	0.508	0.499	0.000	1,000	2,277***					
Observations	2,176	771		1,405									

Note: *, **, *** indicate significance at the 0.10, 0.05 and 0.01 level, respectively; [Table II](#) presents variables' definitions

Internal audit
function
budget

Table III.
Descriptive statistics
for full sample,
family and non-
family companies

Table IV.
Pearson correlation
matrix

Variables	AUDSPECAF	AUDITFEES	IAFBUDG	FAMOW	OUTOW	BODEFF	ACEFF	SIZE
AUDSPECAF	1.000							
AUDITFEES	0.262***	1.000						
IAFBUDG	-0.047**	0.736***	1.000					
FAMOW	0.153***	-0.118***	-0.197***	1.000				
OUTOW	0.072***	0.256***	0.390***	-0.618	1.000			
BODEFF	-0.011	0.218***	0.247***	-0.193***	0.174***	1.000		
ACEFF	0.314***	0.150***	0.184***	-0.060***	0.063***	0.493***	1.000	
SIZE	0.019	0.797***	0.761***	-0.096***	0.320***	0.194***	0.149***	1.000
COMPL	-0.105***	0.331***	0.240***	-0.025	-0.003	0.092***	0.062***	0.245***
RISK	0.031	-0.118***	-0.194***	0.067***	-0.121***	-0.104***	-0.073***	-0.277***
LEV	0.044**	0.211***	0.111***	-0.033	-0.037*	0.058***	0.033	0.248***
ROA	0.003	0.046**	0.108***	0.008	0.069***	-0.009	0.048**	0.133***
AOB	0.152***	0.125***	0.027	-0.009	-0.002	-0.007	0.024	0.045**
AGE	-	0.313***	0.332***	-0.156***	0.134***	0.143***	0.071***	0.386***
BIG4	-	0.306***	0.341***	-0.049**	0.203***	0.059***	0.048**	0.384***

Notes: *, **, *** indicate significance at the 0.10, 0.05 and 0.01 level, respectively, AUDSPECAF is specialist auditor based in audit fees. Table I presents variables' definitions

(continued)

Variables	COMPL	RISK	LEV	ROA	AOB	AGE	BIG4
AUDSPECFAF							
AUDITFEES							
IAFBUDG							
FAMOW							
OUTOW							
BODEFF							
ACEFF							
SIZE							
COMPL	1.000						
RISK	-0.025	1.000					
LEV	0.129***	0.007	1.000				
ROA	-0.028	0.005	-0.100***	1.000			
AOB	-0.031	-0.001	-0.020	0.040*	1.000		
AGE	0.110***	-0.147***	0.007	0.031	0.086***	1.000	
BIG4	0.025	-0.132***	-0.053***	0.092***	0.007	0.193***	1.000

Internal audit
function
budget

Table IV.

4.2 Regression results

4.2.1 Auditor choice results. Table V presents the results from the logit regression for testing *H1*. Three models are provided, each with different measures to classify whether or not an auditor is industry specialist, based on the market share of audit fees, total assets and number of auditees (AUDSPECAF, AUDSPECTA and AUDSPECCL). Using these three measures as dependent variables, for the full sample, the coefficients on IAFBUDG are significant and positive, except for the AUDSPECCL model (0.386, $p < 0.01$; 0.251, $p < 0.10$), indicating that companies with more investment in the IAF are more likely to engage specialist auditors. In addition, for the full sample, a positive association between family ownership and auditor choice is found for two specialization measures (AUDSPECTA and AUDSPECCL) (0.254, $p < 0.10$; 0.249, $p < 0.10$), indicating that family companies are more likely to recruit a specialist audit firm (Kang, 2014). To evaluate the impact of family control on the relationship between IAFBUDG and auditor choice, we estimate the logit regression for family and non-family subsamples to test *H1*. The findings show that the coefficient of IAFBUDG is significantly positive for regression tests with the three specialization measures for non-family companies (0.931, $p < 0.010$; 1.009, $p < 0.010$; 1.065, $p < 0.010$). However, in family companies, insignificant association is found between IAFBUDG and industry-specialist auditors, suggesting that family control could play a negative role. These findings support *H1* that family companies are less likely to promote the positive association between IAFBUDG and the hiring of industry-specialist auditors than non-family companies. These results support the argument that family companies with close monitoring by family members could reduce the information asymmetry and traditional agency problems, resulting in less demand for monitoring mechanisms such as internal and external auditing.

For control variables, the results show that, for the full sample, companies that have outsider blockholders are more likely to recruit better-quality auditors, and this result is maintained in non-family companies. Consistently, in the full sample, the finding shows that companies with effective boards of directors tend to hire industry-specialist auditors (0.175, $p < 0.010$; 0.177, $p < 0.010$; 0.116, $p < 0.100$), and this association is promoted more in non-family companies than in family companies. However, a negative association is reported between ACEFF and auditor choice whether in the full sample or the sub-samples of family and non-family companies, supporting the substitution argument that the presence of an effective audit committee could substitute for the engagement of higher-quality auditors. Consistent with the previous studies on auditor choice, the coefficients on company size are positive, but negative for leverage, indicating that the demand for better-quality auditors is higher for larger companies and lower for companies with more leverage.

4.2.2 Audit fees results. The OLS regression is estimated with robust standard errors adjusted for heteroscedasticity to evaluate the relationship between IAFBUDG and AUDITFEES and how this association is influenced by family control. Table VI presents the results of the audit fees model. Generally, the models' adjusted R^2 values range from 77 to 69 per cent, indicating that the selected variables significantly explain the variance in AUDITFEES with a relatively larger adjusted R^2 (74 per cent, 77 and 69 per cent, respectively) compared with other studies conducted in Malaysia (Abdul Wahab *et al.*, 2011; Tee *et al.*, 2017). For the full sample, a significant positive association between the IAF costs and audit fees is reported, supporting the complementary argument among monitoring mechanisms (0.168, $p < 0.01$). This positive association between the IAF budget and audit fees is also significant for the sub-samples family and non-family companies (0.213, $p < 0.01$; 0.139, $p < 0.01$), indicating that Malaysian companies invest more in both internal and

Variables	AUDSPECFAF		AUDSPECTA		AUDSPECCL		AUDSPECAF		AUDSPECTA		AUDSPECCL	
	All	Coefficient/t-stat	All	Coefficient/t-stat	All	Coefficient/t-stat	NF	F	NF	F	NF	F
IAFBIDG	0.386***	0.251*	0.251*	0.201	0.931***	0.032	1.009***	0.032	1.009***	-0.223	1.065***	-0.239
FAMOW	2.890	1.870	1.870	1.530	3.680	0.190	3.710	0.190	3.710	-1.350	4.300	-1.460
OUTOW	1.430	1.950	1.950	1.930	-	-	-	-	-	-	-	-
BODEFF	0.009***	0.009***	0.009***	0.008***	0.011***	0.004	0.014***	0.004	0.014***	-0.010	0.006	0.007
ACEFF	3.070	3.040	3.040	2.850	2.880	0.570	3.670	0.570	3.670	-1.530	1.540	1.060
SIZE	0.175***	0.177***	0.177***	0.116*	0.297***	0.105	0.228***	0.105	0.228***	0.157**	0.182*	0.088
COMPL	2.880	2.940	2.940	1.850	2.860	1.660	2.160	2.070	2.160	1.660	1.120	1.120
RISK	-0.245***	-0.133**	-0.133**	-0.204***	-0.388***	-0.214***	-0.228*	-0.214***	-0.228*	-0.116	-0.416***	-0.153***
LEV	-3.890	-2.100	-2.100	-3.280	-3.240	-2.810	-1.850	-2.810	-1.850	-3.310	0.554***	-2.060
ROA	0.870***	1.281***	1.281***	0.812***	0.522**	0.992***	0.796***	0.992***	0.796***	1.554***	0.814***	0.814***
AOB	6.160	8.920	8.920	5.900	1.980	5.410	2.810	5.410	2.810	8.420	2.090	4.590
AGE	-0.088*	-0.136**	-0.136**	-0.056	-0.053	-0.139**	-0.160*	-0.139**	-0.160*	-0.146**	-0.090	-0.066
_oms	-1.670	-2.560	-2.560	-1.160	-0.580	-2.230	-1.660	-2.230	-1.660	-2.410	-1.020	-1.120
INDDUMS	-0.113	0.136	0.136	-0.315	0.307	-0.412	0.322	-0.412	0.322	0.016	-0.237	-0.456
YEARUMS	-0.450	0.520	0.520	-1.240	0.680	-1.280	0.650	-1.280	0.650	0.050	-0.520	-1.410
Observations	-0.577*	-0.897***	-0.897***	-1.357***	0.230	-0.956**	0.999**	-0.956**	0.999**	-1.880***	-0.938*	-1.537***
Pseudo R ²	-1.810	-2.700	-2.700	-4.410	0.460	-2.210	2.040	-2.210	2.040	-4.130	-1.820	-3.750
	0.000	0.003	0.003	0.002	-0.003	0.006	0.001	0.006	0.001	0.006	-0.002	0.009
	-0.060	0.960	0.960	0.460	-0.740	0.750	0.210	0.750	0.210	0.740	-0.400	1.140
	0.192	0.257	0.257	0.120	0.040	0.259	-0.042	0.259	-0.042	0.421	0.018	0.169
	0.760	0.950	0.950	0.470	0.090	0.820	-0.090	0.820	-0.090	1.240	0.040	0.550
	0.000	0.006	0.006	-0.015**	-0.005	0.011	0.001	0.011	0.001	-0.022	-0.004	-0.004
	-0.020	0.800	0.800	-1.980	-0.340	1.000	0.110	1.000	0.110	1.130	-1.590	-0.380
	-4.892***	-7.586***	-7.586***	-3.488***	-4.668***	-4.427***	-7.094***	-4.427***	-7.094***	-7.601***	-3.536***	-2.503***
	-7.860	-11.860	-11.860	-5.670	-4.030	-5.400	-5.610	-5.400	-5.610	-9.260	-2.990	-3.150
INCLUDED				Included	Included							
Observations	2.176	2.176	2.176	771	771	1.405	771	1.405	771	1.405	771	1.405
Pseudo R ²	0.136	0.159	0.159	0.127	0.212	0.117	0.274	0.117	0.274	0.128	0.225	0.102

Notes: *, **, *** indicate significance at the 0.10, 0.05 and 0.01 level, respectively. AUDSPECAF, AUDSPECTA and AUDSPECCL are specialist auditor based in audit fees, total assets and client numbers market share, respectively; *All* is a whole sample; *NF* is family companies; *F* is non-family companies. Other variables' definitions are presented in Table 1

Table V.
Auditor choice model

Internal audit
function
budget

Variables	AUDITFEES			IAFAUDITFEES
	ALL Coefficient/ <i>t</i> -stat	NF Coefficient/ <i>t</i> -stat	F Coefficient/ <i>t</i> -stat	ALL Coefficient/ <i>t</i> -stat
<i>IAFBUDG</i>	0.168*** 12.350	0.213*** 8.840	0.139*** 8.180	– –
<i>FAMOW</i>	–0.032** –2.390			–0.187*** –3.060
<i>OUTOW</i>	–0.001*** –4.400	–0.001*** –3.520	0.000 –0.620	0.008*** 4.140
<i>BODEFF</i>	0.012** 2.050	0.009 0.870	0.009 1.360	0.061** 2.300
<i>ACEFF</i>	–0.002 –0.280	0.004	–0.008 –1.080	0.072* 1.940
<i>SIZE</i>	0.389*** 27.130	0.346*** 14.500	0.419*** 22.460	0.489*** 7.790
<i>COMPL</i>	0.047*** 7.840	0.056*** 6.460	0.040*** 5.080	–0.027 –1.430
<i>RISK</i>	0.199*** 8.620	0.271*** 6.770	0.141*** 5.050	–0.362*** –3.380
<i>LEV</i>	0.022 0.740	0.045 0.950	–0.004 –0.110	–0.421*** –2.630
<i>ROA</i>	–0.002** –2.310	–0.001* –1.940	–0.003*** –3.560	0.003 1.360
<i>AOB</i>	0.044** 2.050	0.026 0.670	0.047* 1.900	–0.154 –1.250
<i>AGE</i>	0.000 0.570	0.000 0.120	0.001 0.610	0.006 1.120
<i>BIG4</i>	0.021** 2.020	–0.001 –0.070	0.028** 2.360	0.124*** 3.180
<i>_cons</i>	–0.489*** –7.920	–0.372*** –3.420	–0.595*** –7.640	–1.856*** –5.710
<i>INDDUMS</i>		Included		
<i>YEARDUMS</i>		Included		
Observations	2,176	771	1,405	2,176
<i>R</i> ²	0.738	0.780	0.703	0.200
Adjusted <i>R</i> ²	0.735	0.774	0.698	0.192

Table VI.

Audit fees and ratio of IAF's budget to audit fees models

Notes: *, **, *** indicate significance at the 0.10, 0.05 and 0.01 level, respectively. AUDITFEES is audit fees model; IAFAUDITFEES is a ratio of the IAF budget to audit fees model; *All* is a whole sample; *F* is family companies; *NF* is non-family companies. Other variables' definitions are presented in [Table I](#)

external auditing. Hence, *H2* is rejected. Consistent with previous studies, this finding suggests that internal governance mechanisms and external auditing can complement each other, so that a good internal governance mechanism will be related to higher audit fees (O'Sullivan, 2000; Carcello *et al.*, 2002; Hay *et al.*, 2008). The findings in Model 2 also show that the coefficients of *FAMOW* are significantly negative ($-0.032, p < 0.05$), suggesting that family companies have fewer Type I agency problems with good alignment between the interests of managers and major family shareholders, resulting in less demand for audit quality, and hence paying lower audit fees.

Consistent with the results of the study by Mitra *et al.* (2007), a negative association between *OUTOW* and *AUDITFEES* is found for the full sample and non-family companies ($-0.001, p < 0.01$; $-0.001, p < 0.01$). In addition, audit fees are positively associated with

BODEFF for the full sample, although BODEFF and ACEFF are insignificant for the two sub-samples[10]. Confirming our expectations, auditee size (SIZE), complexity (COMPL), auditee risk (RISK) and auditor type (BIG4) are related positively with audit fees. AOB establishment is also positive and significant at the 5 per cent level with audit fees. This result is in line with the argument that the increase in regulations has led to an increase in the costs of compliance, and subsequently to an increase in audit fees. A negative association between ROA and audit fees is reported.

4.2.3 Mix between internal and external auditing results. Table VI, Column 4 reports the OLS regression with robust standard errors testing *H3* that family companies rely more on the IAF and less on external auditing. The adjusted R^2 is 0.190, which is smaller than reported by Anderson *et al.* (1993), 0.253. The results show that family ownership is related negatively to the ratio of the IAF costs to audit fees, suggesting that family companies rely more on external auditing and less on internal auditing. Thus, the greater the family ownership, the less investment is there in the IAF compared with external auditors. Hence, *H3* is rejected. For the control variable, the coefficients on OUTOW, BODEFF, ACEFF, BIG4 and IAFAUDITFEE are positive and significant, suggesting that companies with more outside blockholders, effective board of directors, effective audit committee and Big 4 audit firms are more likely to invest more in the IAF than external auditing. This result supports the concern of the professional and regulatory bodies in Malaysia that audit fees are slightly on the lower side than in other countries in the region[11]. In addition, consistent with the results of the study by Anderson *et al.* (1993), the larger companies tend to spend more on internal auditing than external auditing (0.489, $p < 0.01$). RISK and LEV are related negatively with IAFAUDITFEE (-0.362, 0.01; -0.421, $p < 0.01$), indicating that investment in the IAF decreases relative to external auditing in increasing the risk and leverage of companies.

4.3 Additional analysis

To assess the robustness of our main results, several additional analyses are conducted. First, alternative measures are used for industry-specialist auditors and family ownership. Second, the inverse Mills ratio is included as a control variable in the audit fees model to control for self-selection bias. Third, two-stage least squares (2SLS), generalized moment method (GMM) regressions and lagged independent variables are used to mitigate the potential endogeneity problem. Finally, the interaction between FAMOW and IAFBUDG is used to strengthen the main results.

4.3.1 Alternative measurement of industry-specialist auditor and family ownership. Following the definition of Palmrose (1986) of auditor industry-specialists as the largest supplier in each industry, to test the robustness of the main results, we identify a specialist auditor as dominating (holding the largest) market share in terms of audit fees, total assets and client numbers. Thus, an auditor is defined as specialist if the auditor has the largest ratio of market share based on audit fees, total assets and auditee numbers in a particular year (Jaggi *et al.* 2015). A dummy variable of 1 is used for companies audited by one of the industry-specialist auditors, and 0 otherwise. Table VII, Columns 1-6 show that the results of using the dominating auditor as a specialist auditor are consistent with the main findings, indicating that there is a significant positive association between IAFBUDG and hiring industry-specialist auditors in non-family companies. However, in family companies, IAFBUDG is related negatively to AUDITSPEC, suggesting that a family company promotes a substitution relation between the IAF and auditor choice. Therefore, the main results are robust to the alternative measurement of specialist auditor.

Table VII.
Auditor choice model
(alternative
measurement for
specialist auditor and
family ownership)

Variables	AUDSPECFAF		AUDSPECTA		AUDSPECCF		AUDSPECAF		AUDSPECTA		AUDSPECCF	
	NF Coefficient/ <i>t</i> -statistic	F Coefficient/ <i>t</i> -statistic	NF Coefficient/ <i>t</i> -statistic	F Coefficient/ <i>t</i> -statistic	NF Coefficient/ <i>t</i> -statistic	F Coefficient/ <i>t</i> -statistic	NF Coefficient/ <i>t</i> -statistic	F Coefficient/ <i>t</i> -statistic	NF Coefficient/ <i>t</i> -statistic	F Coefficient/ <i>t</i> -statistic	NF Coefficient/ <i>t</i> -statistic	F Coefficient/ <i>t</i> -statistic
<i>IAFBUDG</i>	1.664***	-0.278	1.403***	-0.665***	0.830***	-0.364**	0.714***	-0.191	0.786***	-0.571**	0.518***	-0.406
<i>OUTTOW</i>	5.190	-1.450	4.680	-3.460	3.030	-2.070	4.300	-0.770	4.530	-2.370	3.260	-1.550
	-0.900	-0.021***	-0.005	-0.016*	0.009**	-0.020***	0.007***	-0.017	0.006***	-0.021	0.006**	-0.021
<i>BODEFF</i>	0.111	-2.590	-1.160	-1.950	2.220	-2.720	2.670	-1.310	3.130	-1.590	2.050	-1.590
<i>ACEFF</i>	0.980	3.050	1.430	2.980	0.090	3.290	2.280	1.260	2.810	1.040	1.190	0.430
	-0.395***	-0.223**	-0.386***	-0.203**	-0.138	-0.179**	-0.332***	-0.138	-0.262***	0.005	-0.197**	-0.250**
<i>SIZE</i>	0.082	1.236***	0.606**	1.190***	-0.197	1.166***	0.725***	1.203***	0.984***	1.824***	0.683***	1.143***
<i>COMPL</i>	0.290	-0.128*	2.110	5.660	-0.780	5.850	4.300	3.950	5.650	6.230	4.290	3.550
	-2.010	-1.940	-3.510	-1.170	-2.830	-2.710	-1.370	-1.340	-2.260	-1.660	-1.340	-0.500
<i>RISK</i>	0.340	0.123	0.868	-0.230	-0.083	-0.482	-0.172	0.257	-0.048	0.805	-0.478	0.433
	0.620	0.310	1.620	-0.560	-0.170	-1.340	-0.560	0.540	-0.150	1.630	-1.580	0.870
<i>LEV</i>	0.872	-2.962***	0.577	-2.171***	1.452***	-2.218***	0.100	-2.020***	0.168	-2.634***	-0.635*	-3.282***
	1.490	-5.450	1.160	-4.180	2.830	-4.450	0.270	-3.050	0.440	-4.110	-1.800	-4.480
<i>ROA</i>	0.004	-0.006	0.009**	0.007	0.005	0.003	-0.003	0.025**	-0.001	0.030***	-0.003	0.040***
	0.830	-0.600	2.080	0.740	1.120	0.370	-0.810	2.170	-0.140	2.590	-0.790	3.200
<i>AOB</i>	0.839	0.349	0.461	0.775*	0.564	0.606	0.220	-0.139	0.012	0.433	0.069	0.058
	1.550	0.850	0.970	1.840	1.220	1.600	0.710	-0.290	0.040	0.850	0.220	0.110
<i>AGE</i>	0.009	0.006	0.004	0.003	0.030**	0.027**	-0.008	0.019	-0.004	0.029*	-0.023**	0.008
	0.650	0.510	0.290	0.230	2.370	2.480	-0.790	1.240	-0.440	1.900	-2.390	0.510
<i>_cons</i>	-5.190***	-6.403***	-7.366***	-6.110***	-3.033***	-6.141***	-4.542***	-5.421***	-6.764***	-8.904***	-3.160***	-3.788***
	-3.960	-6.720	-5.550	-6.400	-2.760	-6.830	-6.130	-4.020	-8.740	-6.820	-4.410	-2.700
<i>INDDUMS</i>					Included	Included						
<i>YEARDUMS</i>					Included	Included						
Observations	771	1405	771	1405	771	1405	1482	694	1482	694	1482	694
Pseudo R ²	0.217	0.158	0.235	0.162	0.147	0.109	0.162	0.137	0.207	0.137	0.139	0.169

Note: *, **, *** indicate significance at the 0.10, 0.05 and 0.01 level, respectively. AUDSPECFAF, AUDSPECTA and AUDSPECCF are specialist auditor based on audit fees, total assets and client numbers market share, respectively; *All* is a whole sample; *F* is family companies; *NF* is non-family companies. Other variables definitions are presented in [Table II](#)

A cut-off of 50 per cent for family ownership is used to classify whether a company is family- or non-family-controlled (Jaggi *et al.*, 2009; Cascino *et al.*, 2010). Thus, Models 1, 2 and 3 are re-estimated by including the new measurement of family ownership. The results of Table VII, Columns 7 to 12 and Table VII, Columns 1 to 3 support the robustness of the main results.

4.3.2 Controlling for self-selection bias. Superior audit-quality providers can charge higher fees; in particular, the Big 4 charge higher audit fees (Hay, 2013). Chaney *et al.*, (2004) argue that self-selection introduces a bias in the standard OLS regression. The issue of self-selection bias might complicate the understanding of the results of the audit fees model (Hay, 2013). Thus, controlling selection bias is important, where auditor choice is unlikely to be random. To address this issue, this study applies a two-stage method as suggested by Heckman (1979) and (Chaney *et al.*, 2004). In the first stage, a probit model of Big 4 auditor choice is estimated and an inverse Mills ratio variable (MILLS) is obtained [12]. Then, we include the MILLS variable in the audit fees model as a control variable. In the second stage, the audit fees model is re-estimated after including MILLS. After controlling for self-selection bias, the results, as shown in Table VIII, Columns 7 to 8, remained substantially the same.

4.3.3 Endogeneity of IAF budget. Endogeneity is a frequent problem related to accounting research, occurring because of the simultaneous outcome of explanatory variables and omitted variables (Larcker and Rusticus, 2010). The association between IAFBUDG and AUDITFEES may be endogenous, as more investment in the IAF could lead to more (or less) investment in external auditing (audit fees), but similarly, the presence of extensive auditing services could lead companies to reduce or increase their investment in the IAF [13]. In resolving the endogeneity problem, instrumental variable methods are commonly used (Larcker and Rusticus, 2010). Thus, the potential effects of this econometric problem are addressed by using a 2SLS model.

It is argued that the IAF sourcing is related to the IAF quality, and that it can be used as an instrumental variable (Pizzini *et al.*, 2014). Thus, whether IAF arrangements are outsourced to a third party or performed in-house (presence of an internal audit department) can affect the amount of investment in the IAF. This instrumental variable IAFSOUR is chosen because of its effect on the quality and cost of the IAF (Pizzini *et al.*, 2014). A dummy variable IAFSOUR is constructed with a value of 1 for a company that has in-house IAF, and 0 otherwise (Johl *et al.*, 2013). The first-stage model reflects the determinants of investment in the IAF based on prior studies (Carcello *et al.*, 2005; Barua *et al.*, 2010). Table IX, Columns 1-4 present the results for the 2SLS model. The results of the first stage indicate that IAFSOUR is positively and significantly associated to IAFBUDG, suggesting that companies invest more in the IAF by performing in-house IAF than outsourcing it to an internal audit services provider. The second stage findings show that there is a positive association between IAFBUDG and AUDITFEES for both family and non-family companies, indicating that the main results of the audit fees model are robust. This study also uses the GMM model which is considered as more satisfactory into indicating the existence of heteroscedasticity and autocorrelation than 2SLS (Wooldridge, 2010). The results, shown in Table IX, Columns 5 to 8, are nevertheless in line with the findings of 2SLS.

The reverse causality problem can be solved by using the lagged values of the independent variables (Larcker and Rusticus, 2010; Alves *et al.* 2015; Al-Jaifi, 2017). Thus, this study re-estimated Models 1 and 2 by using this method. The results, provided in Table VIII, columns 4 to 5 for the audit fees model and Table X, columns 4 to 9 for auditor choice model, are generally confirmed. Thus, the main results persist, indicating that reverse causality is unlikely.

Table VIII.
Audit fees model
(alternative
measurement for
family ownership,
lagged IVs,
interaction, self-
selection bias and
cluster-adjusted
standard error
(CAAE))

Variables	AUDITFEES		IIFAUDITFEES		Lagged IVs		Interaction		Mills Ratio		CAAE	
	NF Coefficient/ <i>t</i> -stat	F Coefficient/ <i>t</i> -stat	All Coefficient/ <i>t</i> -stat	NF Coefficient/ <i>t</i> -stat	F Coefficient/ <i>t</i> -stat	All Coefficient/ <i>t</i> -stat	NF Coefficient/ <i>t</i> -stat	F Coefficient/ <i>t</i> -stat	NF Coefficient/ <i>t</i> -stat	F Coefficient/ <i>t</i> -stat	NF Coefficient/ <i>t</i> -stat	F Coefficient/ <i>t</i> -stat
<i>IAFBUDG</i>	0.189*** 11.510	0.120*** 4.910	—	0.204*** 7.160	0.113*** 6.020	0.180*** 9.400	0.208*** 6.600	0.232*** 9.150	0.213*** 5.390	0.139*** 5.150	—	—
<i>FAMOW</i>	—	—	-0.112** -2.400	—	—	0.005 0.140	—	—	—	—	—	—
<i>IAFFOW</i>	—	—	—	—	—	-0.021 -1.010	—	—	—	—	—	—
<i>OUTOW</i>	-0.001*** -4.410	-0.002 -1.330	0.009*** 5.310	-0.001*** -2.790	0.000 -0.570	-0.001*** -4.400	-0.002** -2.310	0.002** 2.460	-0.001** -2.010	-0.000 -0.380	—	—
<i>BODEFF</i>	0.014* 1.950	0.005 0.510	0.068*** 2.590	0.013 1.120	0.005 0.650	0.012** 2.050	0.009 0.890	0.006 0.830	0.009 0.670	0.009 0.970	—	—
<i>ACEFF</i>	-0.003 -0.290	-0.003 -0.320	0.069* 1.880	0.004 0.260	-0.009 -1.190	-0.002 -0.340	0.004 0.340	-0.012* -1.780	0.004 0.210	-0.008 -0.710	—	—
<i>SIZE</i>	0.363*** 22.760	0.452*** 16.300	0.480*** 7.710	0.350*** 12.830	0.416*** 19.940	0.388*** 27.100	0.336*** 8.310	0.611*** 14.590	0.346*** 8.920	0.419*** 13.270	—	—
<i>COMPL</i>	0.047*** 7.000	0.043*** 3.330	-0.025 -1.340	0.066*** 5.920	0.079*** 6.620	0.046*** 7.760	0.058*** 5.880	0.015* 1.730	0.056*** 5.330	0.040*** 4.150	—	—
<i>RISK</i>	0.202*** 7.350	0.163*** 3.880	-0.381*** -3.510	0.308*** 6.770	0.119*** 3.390	0.198*** 8.610	0.273*** 6.890	0.093*** 3.140	0.271*** 4.650	0.141*** 3.390	—	—
<i>LEV</i>	0.070** 2.010	-0.050 -1.610	-0.415*** -2.570	0.033 0.600	-0.039 -0.940	0.024 0.810	0.067 0.720	-0.398*** -4.430	0.045 0.560	-0.004 -0.060	—	—
<i>ROA</i>	-0.002** -2.110	-0.002** -1.970	0.003 1.370	-0.001** -2.240	-0.002** -2.360	-0.002** -2.270	-0.001* -1.910	-0.002*** -2.590	-0.001* -1.890	-0.003** -2.430	—	—
<i>AOB</i>	0.049** 1.980	0.020 0.530	-0.154 -1.240	0.020 0.480	0.045* 1.790	0.044** 2.050	0.024 0.630	0.066*** 2.690	0.026 0.760	0.047* 1.900	—	—
<i>AGE</i>	0.002** 2.420	-0.003** -2.220	0.007 1.310	0.000 -0.280	0.000 -0.310	0.001 0.690	0.000 0.020	0.001 1.410	0.000 0.070	0.001 0.340	—	—
<i>BIG4</i>	0.030** 2.320	0.000 -0.010	0.130*** 3.310	-0.010 -0.420	0.025* 1.950	0.020* 1.920	-0.002 -0.120	0.033*** 2.850	-0.001 -0.040	0.028 1.360	—	—
<i>MILLS</i>	—	—	—	—	—	—	-0.032 -0.280	0.537*** 4.800	—	—	—	—

(continued)

Variables	AUDITFEES		IAFAUDITFEES		Lagged IVs		Interaction		Mills Ratio		CAAE	
	NF Coefficient/ <i>t</i> -stat	F Coefficient/ <i>t</i> -stat	All Coefficient/ <i>t</i> -stat	All Coefficient/ <i>t</i> -stat	NF Coefficient/ <i>t</i> -stat	F Coefficient/ <i>t</i> -stat	All Coefficient/ <i>t</i> -stat	NF Coefficient/ <i>t</i> -stat	F Coefficient/ <i>t</i> -stat	NF Coefficient/ <i>t</i> -stat	F Coefficient/ <i>t</i> -stat	NF Coefficient/ <i>t</i> -stat
<i>_cons</i>	-0.458*** -6.400	-0.663*** -5.630	-1.928*** -5.860	-0.347*** -2.810	-0.479*** -5.580	-0.504*** -7.680	-0.290 -0.910	-2.077*** -6.800	-0.372** -2.140	-0.595*** -4.410		
<i>INDDUMS</i>				Included								
<i>YEARDUMS</i>				Included								
Observations	1,482	694	2,176	576	1,056	2,176	771	1,405	771	1,405	771	1,405
<i>R</i> ²	0.757	0.701	0.198	0.780	0.721	0.738	0.781	0.709	0.780	0.703	0.780	0.703

Notes: *, **, *** indicate significance at the 0.10, 0.05 and 0.01, level respectively. AUDITFEES is audit fees model; IAFAUDITFEES is a ratio of the IAF budget to audit fees model; *All* is a whole sample; *F* is family companies; *NF* is non-family companies. Other variables' definitions are presented in Table 1

Table VIII.

Internal audit
function
budget

Table IX.
2SLS and GMM for
audit fees model

Variables	NF		F		NF		F	
	First Coefficient/ <i>t</i> -stat	Second Coefficient/ <i>t</i> -stat	First Coefficient/ <i>t</i> -stat	Second Coefficient/ <i>t</i> -stat	First Coefficient/ <i>t</i> -stat	Second Coefficient/ <i>t</i> -stat	First Coefficient/ <i>t</i> -stat	Second Coefficient/ <i>t</i> -stat
IAFBUDG	-	0.151*** 2620	-	0.084*** 2750	-	0.151*** 2740	-	0.084*** 2890
OUTOW	0.001** 2400	-0.001*** -3.210	0.001 1.230	0.000 -0.570	0.001*** 2.610	-0.001*** -2.920	0.001 1.160	0.000 -0.540
BODEFF	0.035** 2400	0.011 1.050	0.038*** 3.530	0.011 1.520	0.035** 2.450	0.011 1.040	0.038*** 3.520	0.011 1.560
ACEFF	0.070*** 4.380	0.009 0.770	-0.020* -1.820	-0.008 -1.100	0.070*** 4.590	0.009 0.670	-0.020* -1.690	-0.008 -1.090
SIZE	0.601*** 24.750	0.388*** 9.110	0.509*** 25.170	0.453*** 19.730	0.601*** 22.950	0.388*** 9.560	0.509*** 23.290	0.453*** 20.340
COMPL	0.032** 2.520	0.060*** 6.560	0.017* 1.890	0.042*** 7.030	0.032*** 2.650	0.060*** 6.290	0.017 1.420	0.042*** 5.160
RISK	0.251*** 4.020	0.292*** 6.220	0.027 0.600	0.142*** 4.730	0.251*** 4.150	0.292*** 6.340	0.027 0.560	0.142*** 5.110
LEV	-0.216*** -3.160	0.032 0.660	-0.069 -1.210	-0.014 -0.380	-0.216*** -3.190	0.032 0.670	-0.069 -1.180	-0.014 -0.380
ROA	0.000 -0.370	-0.001*** -3.360	-0.001 -1.020	-0.003*** -4.290	0.000 -0.440	-0.001** -2.000	-0.001 -1.000	-0.003*** -3.680
AOB	-0.065 -1.060	0.024 0.570	-0.050 -1.170	0.043 1.550	-0.065 -1.160	0.024 0.640	-0.050 -1.310	0.043* 1.770
AGE	0.005*** 3.020	0.000 0.350	-0.001 -1.000	0.001 0.910	0.005*** 2.630	0.000 0.330	-0.001 -0.890	0.001 0.850
BIG4	0.121*** 4.210	0.008 0.380	0.043** 2.440	0.029** 2.520	0.121*** 4.790	0.008 0.380	0.043** 2.370	0.029** 2.460
IAFSOUR	0.346*** 11.970	-	0.400*** 21.600	-	0.346*** 12.590	-	0.400*** 20.660	-
_cons	-1.925*** -15.100	-0.516*** -3.250	-1.236*** -12.320	-0.692*** -8.320	-1.925*** -14.190	-0.516*** -3.150	-1.236*** -11.980	-0.692*** -8.130

(continued)

Table X.
Auditor choice model
(interaction and
lagged IVs)

Variables	AUDSPECAF		AUDSPECTA		AUDSPECCL		AUDSPECAF		AUDSPECTA		AUDSPECCL	
	All	Coefficient/ <i>t</i> -stat	All	Coefficient/ <i>t</i> -stat	All	Coefficient/ <i>t</i> -stat	NF	Coefficient/ <i>t</i> -stat	F	Coefficient/ <i>t</i> -stat	NF	Coefficient/ <i>t</i> -stat
IAFBUDG	0.822*** 4.470	0.819*** 4.140	0.813*** 4.440	1.056*** 3.540	0.008 0.040	1.080*** 3.260	0.007 0.040	0.008 0.040	-0.170 -0.870	1.080*** 3.260	1.109*** 3.870	-0.199 -1.030
FAMOW	1.472*** 3.930	1.908*** 4.670	2.049*** 5.400	-	-	-	-	-	-	-	-	-
IAFFOW	-0.717*** -3.780	-0.904*** -4.410	-0.997*** -5.140	-	-	-	-	-	-	-	-	-
OUTOW	0.006* 1.940	0.005 1.630	0.004 1.280	0.008* 1.830	0.007 0.910	0.017*** 3.600	0.007 0.910	0.008 0.910	-0.010 -1.290	0.017*** 3.600	0.005 1.240	0.013* 1.790
BODEFF	0.172*** 2.840	0.174*** 2.860	0.114* 1.800	0.319*** 2.480	0.188** 2.070	0.170 1.330	0.188** 2.070	0.188** 2.070	0.174* 1.940	0.170 1.330	0.198 1.540	0.114 1.250
ACEFF	-0.253*** -4.000	-0.140** -2.200	-0.215*** -3.410	-0.534*** -3.730	-0.350*** -3.880	-0.287** -2.010	-0.350*** -3.880	-0.350*** -3.880	-0.191** -2.070	-0.287** -2.010	-0.468*** -3.330	-0.245*** -2.860
SIZE	0.846*** 5.930	1.254*** 8.640	0.786*** 5.660	0.831*** 2.560	0.953*** 4.530	1.026*** 2.960	0.953*** 4.530	0.953*** 4.530	1.571*** 7.180	1.026*** 2.960	0.620** 2.020	0.773*** 3.740
COMPL	-0.088* -1.710	-0.137*** -2.620	-0.059 -1.240	-0.099 -0.850	0.032 0.320	-0.201* -1.760	0.032 0.320	0.032 0.320	-0.093 -0.900	-0.201* -1.760	-0.136 -1.160	0.010 0.110
RISK	-0.126 -0.500	0.109 0.410	-0.342 -1.330	0.672 1.150	-0.728* -1.760	-0.107 -0.170	-0.728* -1.760	-0.728* -1.760	-0.216 -0.500	-0.107 -0.170	0.054 0.100	-0.624 -1.520
LEV	-0.515 -1.600	-0.825** -2.470	-1.268*** -4.090	0.256 0.430	-0.898* -1.840	0.908 1.530	-0.898* -1.840	-0.898* -1.840	-2.350*** -4.350	0.908 1.530	-0.718 -1.220	-1.622*** -3.440
ROA	0.000 -0.120	0.003 0.970	0.002 0.530	-0.004 -0.620	0.013 1.400	0.002 -0.220	0.013 1.400	0.013 1.400	0.024*** 2.680	0.002 -0.220	-0.001 -0.240	0.021** 2.360
AOB	0.188 0.740	0.252 0.940	0.116 0.460	-0.423 -0.920	1.370 1.370	-0.175 -0.360	1.370 1.370	1.370 1.370	0.556 1.500	-0.175 -0.360	-0.232 -0.490	0.147 0.450
AGE	0.003 0.320	0.010 1.160	-0.012 -1.560	-0.012 -0.720	-0.002 -0.530	-0.008 -0.140	-0.002 -0.530	-0.002 -0.530	0.012 0.870	-0.008 -0.140	-0.032** -2.040	-0.008 -0.660
_cons	-5.548*** -8.530	-8.480*** -12.210	-4.441*** -6.860	-5.992*** -4.060	-3.840*** -4.130	-8.223*** -5.170	-3.840*** -4.130	-3.840*** -4.130	-7.814*** -8.040	-8.223*** -5.170	-4.061*** -2.960	-2.343** -2.550
Observations	2,176	2,176	2,176	576	1,056	576	1,056	1,056	1,056	576	576	1,056
Pseudo R^2	0.141	0.166	0.136	0.257	0.135	0.304	0.135	0.135	0.152	0.304	0.229	0.115

Notes: *, **, *** indicate significance at the 0.10, 0.05 and 0.01 level, respectively; AUDSPECAF, AUDSPECTA and AUDSPECCL are specialist auditor based on audit fees, total assets and client numbers market share, respectively; *All* is a whole sample; *F* is family companies; *NF* is non-family companies. Other variables' definitions are presented in [Table II](#)

4.3.4 Interaction between IAF budget and family ownership. To test how the IAF budget in family ownership might affect auditor choice and audit fees, we include an interaction between the IAF budget and family ownership variables to indicate the degree of influence. A negative coefficient on the interaction reported in [Table X](#), Columns 1 to 3 for the auditor choice model indicates that family ownership mitigates the effects of IAFBUDG on auditor choice. This result supports the main findings, as family ownership negatively affects the relationship between IAFBUDG and auditor choice. However, an insignificant coefficient on (IAFBUDG * FAMOW) (-0.021 ; t -statistic = -1.010) is reported in [Table VIII](#), Column 6, consistent with our main findings that family ownership does not moderate the association between IAFBUDG and AUDITFEES.

4.3.5 Cluster-adjusted standard error and BIG4 as dependent variable. We repeat the analyses by clustering standard errors within companies to account for the dependence created by the company effect. [Table XI](#), Columns 1-6 present the results for cluster-adjusted standard error by firms. The findings remain similar, indicating that using cluster-adjusted standard error by firms does not alter the main results. In addition, [Table VIII](#), columns 9-10 present the findings of the audit fees model by clustering standard errors within companies. The findings remain similar, meaning that using cluster-adjusted standard error by firms does not alter the main findings of audit fees model. An alternative proxy for auditor choice (measured by BIG4) is used to robust the findings of auditor choice model. The findings in [Table XI](#), column 6 indicate that the variable investment in the IAF is positively and significantly related with auditor choice (measured by BIG4) in non-family companies, thus suggesting that the main findings are robust.

5. Conclusion

Although accounting researchers enrich the audit literature on the determinants of auditor selection and audit fees, to date, few studies have examined the impact of the IAF budget on auditor choice and audit fees. [DeFond and Zhang \(2014\)](#) argue that research on the IAF is still in its infancy, and there is a lack of substantive research exploring whether the IAF substitutes or complements external auditing. Thus, this study aimed to explore the impact of the IAF budget on auditor choice and audit fees in the Malaysian context. We also investigate whether this relationship is affected by family ownership as, unlike in developed economies, family-controlled shareholders dominate the listed companies in Bursa Malaysia. This research is important to enhance the understanding of family companies' behavior with their unique ownership structure and agency problems on auditor choice and the pricing of auditing services.

Using a sample of 2,176 observations from 2009 to 2012 in Bursa Malaysia, the results for the full sample show that the IAF budget is positively related to hiring industry-specialist auditors and to audit fees. In addition, a positive association between family ownership and auditor choice is reported, suggesting that Malaysian family companies are more likely to engage specialist audit firms. Thus, specialist auditors can be considered as an effective monitoring mechanism for companies run under family domination and control. The findings also show a negative association between family ownership and audit fees, indicating that fewer Type I agency problems and more alignment between managers and shareholders in family companies could lead to less expected audit risk, and hence lower audit fees. This result is consistent with the findings of previous studies that family companies experience lower audit fees than non-family firm ([Ho and Kang, 2013](#); [Srinidhi et al., 2014](#)). In family companies, insignificant association is found between the IAF budget and hire industry-specialist auditors, indicating that family-controlled shareholders with close monitoring of their companies are less likely to support the complementary association

Variables	AUDSPECAF		AUDSPECTA	AUDSPECCL	BIG4		All
	NF Coefficient/ <i>t</i> -stat	F Coefficient/ <i>t</i> -stat	NF Coefficient/ <i>t</i> -stat	F Coefficient/ <i>t</i> -stat	NF Coefficient/ <i>t</i> -stat	F Coefficient/ <i>t</i> -stat	
IAFBUDG	0.931*** 2.650	0.032 0.120	1.009*** 2.610	-0.223 -0.830	1.065*** 2.860	-0.239 -0.880	0.557*** 4.150
FAMOW	- -	- -	- -	- -	- -	- -	0.257** 1.960
OUTOW	0.011* 1.940	0.004 0.380	0.014** 2.440	-0.010 -1.000	0.006 0.950	0.007 0.680	0.012*** 3.840
BODEFF	0.297** 2.370	0.105 0.990	0.228* 1.760	0.157 1.460	0.182 1.220	0.088 0.760	-0.056 -0.880
ACEFF	-0.388** -2.500	-0.214** -1.990	-0.228 -1.420	-0.116 -1.000	-0.416** -2.350	-0.153 -1.360	-0.007 -0.120
SIZE	0.522 1.340	0.992*** 3.400	0.796* 1.840	1.554*** 5.430	0.554 1.300	0.814*** 2.720	1.091*** 7.520
COMPL	-0.053 -0.450	-0.139* -1.870	-0.160 -1.350	-0.146* -1.890	-0.090 -0.670	-0.066 -0.880	-0.141** -2.410
RISK	0.307 0.500	-0.412 -0.900	0.322 0.480	0.016 0.030	-0.237 -0.370	-0.456 -0.960	-0.240 -0.960
LEV	0.230 0.340	-0.956 -1.400	0.999 1.480	-1.880*** -2.610	-0.938 -1.270	-1.537** -2.310	-2.089*** -6.250
ROA	-0.003 -0.680	0.006 0.570	0.001 0.190	0.006 0.560	-0.002 -0.350	0.009 0.850	0.002 0.680
AOB	0.040 0.090	0.259 0.840	-0.042 -0.090	0.421 1.250	0.018 0.040	0.169 0.550	0.143 0.540
AGE	-0.005 -0.210	0.011 0.610	0.001 0.070	0.012 0.660	-0.022 -0.980	-0.004 -0.230	0.006 0.730
_cons	-4.668*** -2.630	-4.427*** -3.440	-7.094*** -3.580	-7.601*** -6.050	-3.536* -1.870	-2.503* -1.860	-6.246*** -9.390
INDDUMS		Included					
YEARDUMS		Included					
Observations	771	1,405	771	1,405	771	1,405	2,176
Pseudo R ²	0.212	0.117	0.274	0.128	0.225	0.102	0.170

Table XI. Auditor choice model (CAAE and BIG4 as dependent variable)

Notes: * **, *** Indicate significance at the 0.10, 0.05 and 0.01 level, respectively; AUDSPECAF, AUDSPECTA and AUDSPECCL are specialist auditor based on audit fees, total assets and client numbers market share, respectively; *All* is a whole sample; *F* is family companies; *NF* is non-family companies. Other variables' definitions are presented in [Table II](#)

between the IAF costs and hiring of industry-specialist auditors than non-family companies. However, the positive relationship between the IAF cost and audit fees for both family and non-family companies suggests that family ownership does not moderate the relationship between the IAF costs and audit fees. Finally, our results show that the greater the family ownership, the lower is the ratio of the IAF costs to audit fees, suggesting that family companies rely more upon external auditing than the IAF.

This study extends the current audit literature by examining the impact of the IAF budget as a determinant of auditor selection and the pricing of audit services in the context of agency problem Type II, where family-controlled shareholders dominate the capital market, particularly in Malaysia. As pointed out by [Hay \(2013\)](#) and [Hay et al. \(2006\)](#), examining the types of dominant owners such as family-controlled shareholders with relation to audit fees and audit quality could be a fruitful area of inquiry. In addition, this paper responds to the

research calls of [DeFond and Zhang \(2014\)](#), [Hay et al. \(2006\)](#) and [Hay et al. \(2008\)](#) to examine the implications of the IAF on the demand and supply of audit quality by using refined measures of the IAF; thus, we provide an updated view on this issue. Our study has policy and practical implications. In particular, policymakers and practitioners could be given insights into how reform in the regulatory environment of the IAF by disclosing its cost could impair or improve the quality of external auditing. Thus, we provide empirical evidence for whether regulatory intervention improves audit quality in Malaysia. However, the IAF has attracted the attention of Malaysian policymakers in recent times; our findings give the issue of the IAF more in-depth analysis to consider the benefits of higher levels of IAF disclosure. Bursa Malaysia and Securities Commission should review current listing requirements by improving the current structural and functional arrangements of the IAF that make the IAF work more effectively. These include its audit scope, relationship with audit committee and its independence from management. In addition, our study spotlights the current downward trend in audit fees in Malaysia and provides practical findings on whether family companies hire audit firms according to price or quality.

This study, like earlier research, has some limitations from which future research directions can be suggested. First, our findings are based on a sample of non-financial companies, so generalizability of the results requires including financial companies. Second, our study could be subject to sampling bias, as 269 of the listed companies are excluded from the sample because they did not disclose their IAF costs. The sample period covers four years from 2009 to 2012; as International Financial Reporting Standards (IFRSs) were fully adopted in 2012 by the Malaysian Security Commission, the generalization of our findings may be limited for the post-IFRS period.

Notes

1. [Villalonga and Amit \(2006\)](#) argue that the incentives of expropriation and monitoring by the major shareholders will be greater if the larger shareholder is an individual or a family, leading to a Type II agency problem.
2. The New York Stock Exchange (NYSE) mandated all listed companies to have an IAF (SEC, 2003).
3. [DeFond and Zhang \(2014\)](#) classify the studies on the IAF into two groups: one to examine the impact of the IAF on financial reporting quality ([Lin et al., 2011](#); [Prawitt et al., 2009](#)), and second, to investigate the relationship between the IAF and external auditing ([Felix et al., 2001](#); [Abbott et al., 2012a, 2012b](#)).
4. Family-controlling shareholders may exercise their influence on the recruitment, selection and appointment of the board members, regardless of their qualifications or skills, and so may indirectly affect their decisions ([Ho and Kang, 2013](#)).
5. The members of the board of directors and audit committee are free from the pressures of controlling shareholders and may seek to protect their reputation.
6. Auditor specialists were identified based on their industry market share (audit fees, total assets and client number).
7. The 10 percent cut-off point was used because [Ferguson et al. \(2003\)](#) indicate that the market share of the top-ranked audit firms ranges from 28 to 10 percent.
8. This study summarizes the scores of the four characteristics of the board of directors and audit committee to calculate a composite measure of BODEFF and ACEFF. A value of 1 is assigned for each characteristic whose measure is above the sample median, and 0 otherwise. However, for the independence of the audit committee, the value of 1 is assigned if all the members of the committee are independent, and 0 otherwise. A composite measure of BODEFF and AEF is

assumed, to obtain aggregate measures ranging from “0” to “4”. A higher score of BODEFF and ACEFF indicates greater effectiveness of the board of directors and audit committee.

9. An outside substantial shareholder, either individual or institutional, is defined as a shareholder who is independent of the company’s management and holds 5 percent or more of the shares.
10. This result could be attributed to directors in Malaysian companies having low ability to do their monitoring, when they are dominated and controlled by management (Abdul Rahman and Ali, 2006). Thus, they easily become symbolic board members.
11. The audit fees in Malaysia are considered by some audit firms to be lower than those of other countries in the region (Lee and Azham, 2008). The former AOB executive chairman, Nik Mohamed Hasyudeen Yusoff, declared that companies should consider auditors as supporters for enhancing their value rather than sources of costs (The Star, 2011).
12. $BIG4 = \beta_0 + \beta_1 IAFBUDG + \beta_2 OUTOW + \beta_3 BODEFF + \beta_4 ACEFF + \beta_5 SIZE + \beta_6 COMPL + \beta_7 RISK + \beta_8 LEV + \beta_9 ROA + \beta_{10} AGE + \beta_{11} AOB + YEARDUM + INDUSRYDUM + \varepsilon$, all variables are defined in Table 2.
13. Hay et al. (2008) argue that the association among monitoring mechanisms could be endogenous, where good internal monitoring mechanisms could lead companies to demand a more (or less) extensive audit service; equally, the presence higher audit quality could lead companies to increase (or reduce) the demand for other monitoring mechanisms.

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