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Article

The effect of audit quality on transfer pricing aggressiveness and firm risk: Evidence from Southeast Asian countries

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The effect of audit quality on transfer pricing aggressiveness and firm risk: Evidence from Southeast Asian countries

Dewi Kartika Sari^{1*}, Sylvia Veronica Siregar¹, Dwi Martani¹ and Ludovicus Sensi Wondabio¹

Abstract: This research examines the relationship between audit quality and transfer pricing aggressiveness (*TPAG*), the impact of *TPAG* on firm risk, and the indirect effect of audit quality on firm risk through *TPAG*. The research is important in reaffirming the auditor-client relationship, increasing companies' understanding of the advantages and disadvantages of transfer pricing in their strategies, and advancing research on audit quality and firm risk considering the tax aspects of multinational companies. Data were collected from non-financial publicly listed companies in three Southeast Asian countries, Indonesia, Malaysia, and Singapore, from 2014 to 2018, totaling 1,470 firm-year, using the panel data regression. The result indicates that multinational companies audited by high-quality (Big-N) audit firms exhibit higher levels of *TPAG*. Moreover, companies that employ more *TPAG*

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PUBLIC INTEREST STATEMENT

This research examines the relationship between audit quality and transfer pricing aggressiveness (*TPAG*), the impact of *TPAG* on firm risk, and the indirect effect of audit quality on firm risk through *TPAG*. Using data from non-financial publicly listed companies in three Southeast Asian countries, Indonesia, Malaysia, and Singapore (2014 to 2018), this research demonstrates that multinational companies audited by high-quality (Big-N) audit firms exhibit higher levels of *TPAG*. Moreover, companies that employ more *TPAG* practices are likely to have lower firm risk because their transfer pricing transactions are efficient. This result indicates that companies need to consider transfer pricing's benefits in their strategies. This research also highlights that better audit quality indirectly reduces firm risk by influencing *TPAG*. The results reveal that Big-N audit firms effectively play information and insurance roles. Consequently, analysts and investors are more confident that companies hiring Big-N audit firms have better quality and lower risk.

practices are likely to have lower firm risk because their transfer pricing transactions are efficient. This research also highlights that better audit quality indirectly reduces firm risk by influencing *TPAG*.

Subjects: South East Asian Business; Accounting; Auditing; Corporate Finance

Keywords: Audit quality; Big-N; transfer pricing aggressiveness; firm risk; Southeast Asian countries; ASEAN

1. Introduction

The issue of base erosion and profit shifting (BEPS) continues to have significant financial implications globally. The BEPS project, initiated in September 2013 and consisting of 15 related actions, aimed to mitigate profit shifting, but the problem persists despite these efforts. Annual losses attributed to BEPS range from 100 to 240 billion dollars, which accounts for a substantial portion of the global corporates' income tax revenue, estimated at 4% to 19% (Organization for Economic Co-operation and Development OECD, 2023).

The determinants of transfer pricing aggressiveness (*TPAG*) have been the subject of some research. For instance, Richardson et al. (2013) and Sari et al. (2020) explored the factors that drove *TPAG*. In addition, Jones et al. (2018) found a positive relationship between the use of Big-N audit firms and the number of multinational subsidiaries in tax haven countries within developed countries. This result suggested that the involvement of Big-N audit firms might play a role in corporate tax planning strategies.

The research conducted by Jones et al. (2018) shed light on the challenges that auditors encounter when dealing with agency problems. Auditors, as representatives of shareholders, are responsible for monitoring a company's performance. However, as the company pays them, satisfactory services are also provided (Gavious, 2007). Companies may seek the assistance of auditors in obtaining various information related to their business, such as tax and transfer pricing information. This exchange of knowledge, known as "knowledge spillover" (Simunic, 1984), can vary depending on the audit firm's quality and auditors' access to international tax information in a globalized business world. The quality of the information provided tends to be higher when the audit firm's quality is higher.

Big-N is commonly used to measure audit quality (Bakri & McMillan, 2021; DeAngelo, 1981; Eshleman & Guo, 2014; Sarhan et al., 2019). Additionally, Big-N audit firms possess superior international tax knowledge compared to non-Big-N audit firms due to their extensive global networks and greater available resources. Consistent with McGuire et al. (2012), who argue that auditors with overall expertise are positively associated with corporate tax aggressiveness, Big-N audit firms' extensive knowledge enables their clients to engage in international tax planning, especially related to transfer pricing transactions.

Big-N audit firms also play better insurance and information roles than non-Big-N (Dye, 1993; Willenborg, 1999). This opinion is supported by prior research documenting the positive perception of the market in hiring Big-N audit firms. Clients of Big-N audit firms benefit from more accurate analyst forecasts (Behn et al., 2008), lower cost of equity (Khurana & Raman, 2004), and also lower cost of debt (Pittman & Fortin, 2004) compared to clients of non-Big-N audit firms. Therefore, hiring a Big-N audit firm as auditors can arguably mitigate a firm's risk.

Despite their competence and roles, the independence of Big-N audit firms is questioned by some scholars because of many reports indicating their involvement in the tax avoidance activities of clients. For instance, there have been notable cases, such as the connection of PwC to the "LuxLeaks" scandal and recent revelations indicating that Big-N audit firms have entities

established in tax haven jurisdictions (International Consortium of Investigative Journalists – ICIJ, 2014). Jones et al. (2018) also discovered a positive association between Big-N audit firms and the number of multinational subsidiaries in tax haven countries, suggesting a potential involvement of Big-N audit firms in aggressive tax planning.

Multinational companies (MNCs) may excessively exploit Big-N audit firms' tax knowledge and international networks. Therefore, hiring Big-N audit firms as auditors will increase the transfer pricing aggressiveness and, eventually, firm risk. Hence, auditors are indirectly related to firm risks.

Firms that engage in tax avoidance strategies, particularly through transfer pricing schemes, potentially expose themselves to increased risk. Transfer pricing strategies operating within the grey areas of legality are more susceptible to litigation, which in turn lead to fines, introduce greater uncertainty into firms' future cash flows, and raise the possibility of losses for both firms and investors. Previous research found that the market tends to react negatively to announcements of transfer pricing penalties (Eden et al., 2005). Guenther et al. (2017) also stated that cash tax rate volatility positively relates to future stock volatility. Furthermore, Abdul Wahab et al. (2022) show that book-tax differences positively affect share return volatility. This research indicates that tax avoidance activity may increase firm risk.

Based on the above explanation, it is evident that audit quality can have both positive and negative effects on *TPAG*. Audit quality also likely indirectly affects firm risk through firms' transfer pricing aggressiveness. Further, transfer pricing aggressiveness can positively affect firm risk. Therefore, this research aims to empirically examine the effect of audit quality on *TPAG*, the effect of *TPAG* on firm risk, and the indirect effect of audit quality on firm risk through *TPAG* mechanisms.

This research combines Frank et al. (2009) and Richardson et al. (2013) tax aggressiveness concepts. Therefore, *TPAG* is defined as the activities carried out by companies to reduce after-tax profits by exploiting the gaps or differences in each country's tax regulations. These activities may involve classified and unclassified forms of tax evasion and can be carried out through related party transactions or tax haven countries. The term Big-N is used to represent large audit firms in general, including both Big-4 and Big-10 firms. However, specific mentions of Big-4 or Big-10 are made when necessary.

Empirically, prior literature examined the relationship between Big-N audit firms and tax avoidance (Goh et al., 2013; McGuire et al., 2012). However, no previous research specifically evaluated firm tax avoidance mechanisms. Previous research also examined the relationship between tax avoidance and firm risk (Abdul Wahab et al., 2022; Badertscher et al., 2013; Dyreng et al., 2018; Guenther et al., 2017; Rego & Wilson, 2012; Shevlin et al., 2013), with none specifically examining firms' tax avoidance methods. Lastly, previous research showed that Big-N audit firms likely reduce firm risk (Boone et al., 2010; Cassel et al., 2013; Eshleman & Guo, 2014). These researches did not consider MNCs' tax aspects. In contrast to non-MNCs, MNCs have more significant opportunities to carry out international tax planning by exploiting tax rate differences between countries and their networks abroad. Evidence from an in-depth interview conducted by Sebele-Mpofu et al. (2021) with tax consultants in Zimbabwe showed that Zimbabwean MNCs used tax havens to manipulate transfer pricing. MNCs engaging in *TPAG* schemes have greater litigation risk and lead to firm risk.

This current paper seeks to contribute to the existing literature. Firstly, it investigates the impact of audit quality on tax avoidance through the mechanisms of *TPAG*. By examining how audit quality influences firm tax avoidance through *TPAG*, this research is important to reconfirm the auditor-client relationship by providing empirical evidence that sheds light on the diverse effects of audit quality on tax avoidance practices facilitated by *TPAG*. Secondly, it explores the relationship between *TPAG* and firm risk. Given the increasing globalization and the evolving regulations surrounding transfer pricing, it is crucial to understand whether engaging in *TPAG* activities amplifies firm risk. This analysis will enable companies to consider the advantages and

disadvantages of utilizing transfer pricing in their strategic decision-making. Third, this research contributes empirical evidence regarding the indirect effect of audit quality on firm risk mediated by *TPAG*. Examining this mediated relationship valuable to ensure that research on this issue has included all relevant variables, enhancing the results' reliability and comprehensiveness.

This research focuses on companies from three developing countries in Southeast Asia, namely Indonesia, Malaysia, and Singapore. These countries are selected because they represent certain characteristics of Southeast Asian developing countries, particularly regarding the legal origin (common vs. civil law) and ownership structure (family vs. state ownership). From a legal origin perspective, Singapore and Malaysia follow the common law system inherited from the British legal tradition, while Indonesia adopts the civil law system influenced by the French legal tradition. Regarding ownership structure, Indonesian and Malaysian firms are predominantly family-owned, while Singaporean firms are mostly government-owned (Claessens et al., 2000). The choice of these countries as the research sample is significant due to the regional context of Southeast Asia. Since 2015, the ASEAN (Association of Southeast Asian Nations) member countries have agreed to achieve economic integration through the ASEAN Economic Community (AEC). AEC facilitates free flows of goods, services, investments, skilled labor, and capital between the ASEAN countries. The AEC promotes regional stability, prosperity, and competitiveness while creating opportunities for increased transfer pricing transactions among ASEAN countries. On the other hand, this can increase transfer pricing transaction opportunities.

This research reveals that MNCs employing Big-N audit firms tend to display higher levels of *TPAG* than those not utilizing such firms. Additionally, increased *TPAG* is associated with a reduction in firm risk. The interpretation of these results is based on the notion that *TPAG* practices adopted by firms are considered efficient and value-increasing. Consequently, the market perceives these activities positively, leading to a potential reduction in overall firm risk. This result aligns with the efficient contract hypothesis (Christie & Zimmerman, 1994; Holthausen, 1990).

This research further reveals that audit quality directly impacts reducing firm risk, and this effect is both direct and indirect through the mediating role of *TPAG*. *TPAG* acts as a mechanism through which the relationship between audit quality (distinguishing between Big-N and non-Big-N audit firms) and firm risk is mediated. Therefore, one must incorporate transfer pricing aggressiveness as an important variable when investigating the relationship between audit quality (Big-N vs. non-Big-N) and firm risk.

The remaining sections of the article are structured as follows. Section 1 explains why three Southeast Asia countries, Indonesia, Malaysia, and Singapore, are the appropriate context for conducting this research. Section 2 shows the Theoretical literature review. Section 3 shows the Empirical literature review and hypotheses development. Section 4 presents the research design. Section 5 shows empirical results, discussion, and further analysis. Finally, Section 6 concludes the article by summarizing the key findings, discussing their implications, and suggesting avenues for future research.

2. Background

Following the introduction of the BEPS Action in 2013, many countries have implemented regulations concerning transfer pricing in alignment with the transfer pricing guidelines issued by the OECD. The EY Worldwide Transfer Pricing Reference Guide 2018–2019 (EYGM Limited, 2019) determined the development of transfer pricing regulations in Indonesia, Malaysia, and Singapore. On 30 December 2016, the Indonesian Minister of Finance issued a new regulation, namely PMK–213. This regulation was enacted in response to the BEPS Action, particularly BEPS Action 13. PMK–213 provides comprehensive guidance on the additional documents and information that taxpayers engaging in transactions with related parties are required to maintain, as well as the procedures for compliance. Under PMK–213, taxpayers are required to prepare a three-tiered structure for transfer pricing documentation, namely Master file, Local file, and CbCR

(Country-by-Country Report). The issuance of PMK–213 signifies a new era of transparency in disclosing related-party transactions and establishes contemporary requirements for transfer pricing documentation in Indonesia.

In Malaysia, transfer pricing was legislated in Section 140A of the Income Tax Act (ITA). The country introduced transfer pricing rules and guidelines in 2012, effective 1 January 2009. Subsequently, updated guidelines were released on 15 July 2017, applicable for Transfer Pricing Documentation prepared after 15 July 2017. Malaysia has adopted BEPS Action 13 in its local regulation, which consists of Master files, local files, and CbCR.

In Singapore, the local government introduced the “Income Tax (Transfer Pricing Documentation) Rules 2018” through publication in the Singapore Government Gazette. These rules came into effect on 23 February 2018 and are applicable to the basis period for Year Assessment (YA) 2019 onwards. Concurrently, the Inland Revenue Authority of Singapore (IRAS) issued the fifth edition of the Singapore Transfer Pricing Guidelines (2018 Singapore Transfer Pricing Guidelines) on the same date. In responding to BEPS Action 13, the IRAS has not adopted the BEPS master file and local file as separate documents. However, the information requirements for Singapore transfer pricing documentation largely align with the approaches suggested by the OECD. The 2018 Singapore Transfer Pricing Guidelines follow a two-tiered approach, necessitating the inclusion of both group-level and entity-level details when preparing Singapore transfer pricing documentation. For CbCR, IRAS has published an e-tax guide on CbCR outlining the requirements. Broadly, CbCR is mandatory for a multinational group in relation to a financial year commencing on or after 1 January 2017 (but before 1 January 2018).

In Indonesia, transfer pricing is frequently subject to review as part of both regular and special tax audits. The tax authority is known for scrutinizing transfer pricing methodologies, and the country has a contentious environment regarding this process. This condition is partly due to the government’s aim to increase tax collection as a percentage of the GDP. Singapore has a moderate to high likelihood of transfer pricing-related audits. The Inland Revenue Authority of Singapore (IRAS) may raise inquiries regarding transfer pricing during routine firms’ income tax reviews or through consultations with taxpayers. The likelihood of the transfer pricing methodology being challenged is also medium to high. In Malaysia, tax audits, including transfer pricing audits, typically cover a period of three to seven years. While the probability of annual audits is moderate, firms with related-party transactions are more likely to be reviewed. The Inland Revenue Board of Malaysia favors traditional methods over profit methods and recommends using profit-based methods only when traditional methods cannot be reliably applied. Therefore, when a profit-based method is utilized without proper substantiation, there is a high risk of the methodology being challenged (EYGM Limited, 2019).

Based on the explanation provided, apart from the different implementations of transfer pricing regulations in each country, the possibility of companies being examined regarding transfer pricing is also different. The striking difference is for Indonesia, where in an aggressive transfer pricing controversy environment, the government did an aggressive audit to increase Indonesia’s tax collection. This condition is in line with La Porta et al. (2008) opinion, which states that countries that adhere to civil law will have more pro-government regulations than common law. As a result of this condition, the quality of the audit firm used by a company will play a crucial role in determining the decisions and strategies to adopt. Therefore, to examine the effect of audit quality on transfer pricing aggressiveness, the effect of transfer pricing aggressiveness on firm risk, and the indirect effect of audit quality on firm risk through transfer pricing aggressiveness, research using Indonesia, Malaysia, and Singapore is the most appropriate setting.

3. Theoretical literature review

According to Jensen and Meckling (1976), the agency relationship is an agreement where one or more people, known as the principal, contract with another person, referred to as the agent, to

make decisions that benefit the principal. However, conflicts can arise when both parties prioritize their interests, leading to what is known as agency problems. To mitigate these problems, the principal incurs agency costs, which involve providing incentives to the agent and implementing monitoring mechanisms to limit inappropriate actions.

When a company is made up of several contracts, called the nexus of contracts, and there is a separation between ownership and control (as Fama & Jensen, 1983 describe), monitoring these contracts becomes extremely important. In this situation, accounting and auditing are crucial in monitoring contracts (Watts & Zimmerman, 1986). Accounting involves the preparation of financial statements, which falls under the purview of the responsibility of the management, while auditors assess the fairness of these statements. However, auditors can also encounter agency problems due to institutional mechanisms. Auditors are tasked with monitoring management's financial statements to benefit shareholders, and it is worth noting that management pays for the audit services, giving rise to a conflict of interest for auditors (Gavious, 2007).

Audit firms often provide both audit and non-audit services. While providing non-audit services can potentially compromise auditors' independence, it leads to "knowledge spillovers" that improve auditors' competency and efficiency (Simunic, 1984). DeAngelo (1981) postulated that expertise increased the market share of audit firms. Suppose a Big-N audit firm possesses greater expertise compared to other firms. In that case, the client's firm may leverage the "knowledge spillovers" from the Big-N firm to its advantage, including in areas such as company tax planning, particularly concerning transfer pricing strategies. The research conducted by Kanagaretnam et al. (2016) supported this proposition, showing that auditors' quality can indirectly influence a company's approach to corporate tax aggressiveness. However, alongside the capabilities of a Big-N audit firm, engagement risks also arise from their involvement, such as litigation risk, reputation risk, and regulation risk (DeFond & Zhang, 2014). The bigger the audit firm, the more significant the impact of the engagement risks faced by the audit firm. This risk is an incentive for Big-N to always maintain the quality of its audits.

Related-party transactions that involve transfer pricing are common activities within companies, and it is important to note that these transactions are not inherently negative. Two hypotheses explain the occurrence of related party transactions, namely the shareholder takeover hypothesis and the efficient contract hypothesis (Ryngaert & Thomas, 2012). When the impact of these transactions is deemed detrimental to the interests of shareholders, it supports the shareholder expropriation hypothesis. On the other hand, the efficient contract hypothesis posits that firms utilize the information they possess to engage in related-party transactions, ultimately enhancing shareholder value. According to Holthausen (1990), the efficient contract hypothesis involves deliberate actions of the management aimed at increasing the firm value.

Guenther et al. (2017) showed a connection between tax avoidance and firm risk. Following the "high-risk, high-return" venture in conjunction with the theoretical stance of portfolio theory (Markowitz, 1952), firms may engage in aggressive transactions that entail risks because such actions can yield benefits for the firm. However, tax avoidance is likely to increase firm risk for several reasons. Firstly, tax avoidance can introduce uncertainty regarding the future of tax payments in a firm, as tax authorities scrutinize its policies and make changes in regulations, thereby leading to ambiguous rules. Higher tax payments increase the uncertainty in firms' overall cash flows. Secondly, the extent of a firm tax avoidance activities may indicate its investment risks. For instance, firms can reduce their effective tax rates by investing in countries with lower tax rates to offset investment risk. Tax avoidance activities can complicate financial statement reporting and disclosures, reduce transparency, and heighten firm cash flow uncertainty. This argument is supported by Abdul Wahab et al. (2022) findings, showing that book-tax differences are related to idiosyncratic risk. Although these two studies showed a relationship between tax avoidance and firm risk, they did not investigate the mechanism of tax avoidance by companies. Based on the

explanation above, this research aims to investigate the effect of audit quality on *TPAG*, *TPAG* on firm risk, and the indirect effect of audit quality on firm risk through *TPAG*.

4. Empirical literature review and hypotheses development

4.1. Audit quality and transfer pricing aggressiveness

Empirical results showed that audit firms with overall (audit and tax) expertise used their expertise to provide the best services for clients (McGuire et al., 2012). Overall, Big-N audit firms have been recognized for their extensive expertise, global resources, and networks, which enable them to provide clients with top-notch information regarding international taxes (DeAngelo, 1981). Through the phenomenon of “knowledge spillovers” (Simunic, 1984), clients tend to capitalize on the overall expertise and resources of Big-N audit firms to engage in tax avoidance, particularly in the context of international taxes. Consequently, hiring Big-N as external auditors potentially increases firm tax aggressiveness through *TPAG* mechanisms.

Sikka and Hampton (2005), Lisowsky (2010), and the Committee of Public Accounts, House of Commons, Committee of Public Accounts - HC (2013) extensively examined the role of large accounting firms in the realm of tax avoidance, shedding light on the concerns surrounding this issue. Sikka and Hampton (2005) provided comprehensive evidence and descriptions of various cases that exemplified the strategies and tactics employed by audit firms in promoting different tax avoidance schemes. These cases included the involvement of Arthur Anderson and Deloitte & Touche in the Enron scandal and KPMG in the WorldCom case. Similarly, Lisowsky (2010) conducted research on the subject and found a positive relationship between Big-4 accounting firms and tax sheltering activities.

The official report issued by the Committee of Public Accounts, House of Commons, Committee of Public Accounts - HC (2013) regarding the role of large accounting firms in tax avoidance also showed that Big-4 firms play a critical role in their clients’ taxation policies. The report included interviews with the heads of the Big-4 firms’ tax divisions in the UK. The firms acknowledged having internal guidelines distinguishing between tax planning and aggressive tax avoidance. However, these guidelines did not prevent them from promoting schemes with at least a 50% chance of success in court. The report also highlights the resource disparity between HM Revenue & Customs and the Big-4 firms. For example, the HM Revenue & Customs has 65 transfer pricing experts, while each Big-4 firm has around 250. Regarding international tax avoidance, Jones et al. (2018) found a positive relationship between hiring Big-4 firms and the size of MNCs’ tax haven networks in 5,912 multinational companies from 12 developed countries during the 2005–2013 period.

However, other research stated that Big-N firms act independently and professionally by reducing their clients’ tax avoidance aggressiveness (Goh et al., 2013; Kanagaretnam et al., 2016). These researches revealed a negative relationship between Big-N auditors and tax aggressiveness, attributed to concerns over litigation risk and reputational considerations. According to Goh et al. (2013), auditors’ resignation is positively associated with corporate tax aggressiveness, indicating they are wary of potential legal consequences and damage to their reputations. Their findings indicate that clients’ tax aggressiveness raises auditors’ concerns over litigation possibilities and reputation loss. Auditors likely resign to avoid these risks when they cannot reduce clients’ tax aggressiveness. Kanagaretnam et al. (2016) also provided evidence of a negative association between auditors’ quality and tax aggressiveness in 31 non-US countries.

Based on the characteristics of the research samples, it can be observed that Sikka and Hampton (2005), Lisowsky (2010), and the Committee of Public Accounts, House of Commons, Committee of Public Accounts - HC (2013) focused on companies that had been proven to be involved in tax violations or used tax shelters. In contrast, Goh et al. (2013) examined companies that underwent auditors’ changes within a specific period, and Kanagaretnam et al. (2016) used a more diverse

sample of 31 non-US countries. Consequently, the findings of Goh et al. (2013) and Kanagaretnam et al. (2016) were presumed to have broader applicability compared to those of Sikka and Hampton (2005), Lisowsky (2010), and the House of Commons, Committee of Public Accounts - HC (2013).

Additionally, considering the findings of Rasheed et al. (2021) that indicate related party transactions increase audit risk, and the possibility of companies in Indonesia, Malaysia, and Singapore being examined regarding transfer pricing, this research argues that Big-N audit firms will continue to act independently and professionally to reduce their clients' TPAG behaviour. This proposition is based on two factors, including 1) Big-N audit firms possess superior expertise and greater independence compared to non-Big-N audit firms, and 2) Big-N audit firms face more substantial risks in terms of litigation and reputation compared to their non-Big-N counterparts (DeFond & Zhang, 2014). Therefore, the first hypothesis of this research is as follows:

H1: MNCs audited by Big-N audit firms exhibit lower transfer pricing aggressiveness than those not audited by Big-N audit firms.

4.2. Transfer pricing aggressiveness and firm risk

Dyreg et al. (2018) used data from US firms between 2008 and 2014, specifically focusing on firms with uncertain tax benefit information. It found that tax-avoiding firms with lower cash-effective tax rates have higher tax uncertainty levels than those with higher cash-effective tax rates. In this context, tax uncertainty refers to the risk of losing tax benefit claims due to investigations by tax authorities, specifically uncertainty tax benefits. The research also revealed that the relationship between tax avoidance and tax uncertainty is stronger for firms that frequently register patents and have subsidiaries in tax haven countries. Consequently, these findings implied that using tax havens to minimize tax obligations increased firm risk.

Jaafar and Thornton (2015) also conducted research that focused on European firms. It observed that public and private firms that utilized tax havens have lower effective tax rates. This result suggested that using tax havens can effectively reduce companies' tax obligations. On the other hand, Guenther et al. (2017) found a relationship between the cash tax rate and future stock volatility in US firms from 1987 to 2011. Abdul Wahab et al. (2022) conducted research using Malaysian non-financial listed firms from 2013 to 2017 and found that Book-tax differences can increase firm total and idiosyncratic risks.

As defined in this research, TPAG potentially contributes to increased firm risk for several reasons. Firstly, when firms engage in TPAG practices, it raises uncertainty about future tax payments (cash outflows). By manipulating prices in related party transactions, firms can shift their profits to jurisdictions with lower tax rates, thereby facilitating complex tax schemes. However, such activities can attract scrutiny from tax authorities, leading to potential challenges and investigations. Secondly, the extent of a firm tax avoidance practices may indicate its investment risk.

Based on the findings of Sari et al. (2020), indicating a positive relationship between inter-country tax rate differences and related party transactions, and the research by Nuritomo Utama and Hermawan (2019), stating that related party transactions are a tax avoidance strategy, this research proposed the following hypothesis:

H2: Transfer pricing aggressiveness positively affects firm risk.

4.3. Audit quality, transfer pricing aggressiveness, and firm risk

The efficient market theory asserts that market prices accurately reflect publicly available information. However, various factors, such as transaction costs and idiosyncratic firm risks, can hinder the efficiency of the market, limiting investors' ability to engage in arbitrage opportunities (Scott, 2015). Consequently, investors often rely on third-party sources that provide additional information and safeguard against potential errors. In this context, auditors play a vital role by fulfilling the information and insurance roles (Dye, 1993).

Big-N audit firms are frequently utilized as a proxy for audit quality. These firms are deemed competent due to their substantial investments in resources and staff training. Additionally, their larger clients' portfolios help minimize income shocks resulting from clients' decisions to terminate engagements, which enhances their independence. It is anticipated that Big-N audit firms would contribute to reducing firm risk (DeAngelo, 1981; Francis et al., 1999; Krishnan, 2003; Siregar & Dan Utama, 2008).

The viewpoint expressed is consistent with previous research highlighting the positive market perception of Big-4 firms. Big-N audit firms, including the Big-4, are recognized for fulfilling insurance and information roles, benefiting investors (Dye, 1993; Willenborg, 1999). As a result, firms audited by Big-4 firms tend to experience certain advantages compared to non-Big-4 clients, as shown by various research. The research by Behn et al. (2008) revealed that Big-4 clients have more accurate analyst forecasts. The expertise and reputation of Big-4 auditors contribute to the reliability and quality of financial information, leading to improved forecasts and assessments by financial analysts (Pittman & Fortin, 2004).

Behn et al. (2008), Khurana and Raman (2004), and Pittman and Fortin (2004) focused on the positive market reaction associated with firms' decisions to hire Big-N audit firms. However, these researches did not specifically investigate the impact of audit quality differences on the risk of MNCs.

MNCs possess distinct characteristics that facilitate their ability to engage in tax avoidance through international tax planning. This tax avoidance often involves the use of transfer pricing schemes. However, it is important to note that firms employing TPAG strategies in their international tax planning expose themselves to potential litigation, which can increase their level of risk. Nevertheless, the "high-risk, high-return" venture, in conjunction with the theoretical stance of portfolio theory (Markowitz, 1952), may cause firms to engage in aggressive transactions that entail risks because such actions can yield benefits for the firm. The extent of risk stemming from TPAG is closely linked to the audit quality of the firms engaged in these practices.

Big-N audit firms arguably have better competence and more extensive global networks that enhance their knowledge of tax regulations of various countries. Firms hiring Big-N audit firms can exploit their advantages in planning TPAG. Recent research and evidence suggested that Big-N audit firms have the potential to influence their clients' TPAG through the utilization of their global resources and networks. These researches highlight that clients, particularly MNCs, can extensively leverage the international tax information provided by Big-N audit firms to engage in TPAG practices (House of Commons, Committee of Public Accounts - HC, 2013; International Consortium of Investigative Journalists - ICIJ, 2014; Jones et al., 2018; Lisowsky, 2010; Sikka & Hampton, 2005). Clients (in this case, MNCs) may use Big-4 audit firms' information to engage in TPAG (pushing applicable legal and regulatory boundaries). However, engaging in such aggressive practices can expose clients to potential legal sanctions from tax authorities (Eden et al., 2005) or market-based penalties in the form of reduced share prices (Guenther et al., 2017). Thus, Big-N audit firms can positively affect firm risk as mediated by TPAG.

Big-N audit firms try to mitigate risks by fulfilling their roles in engagements, which involves ensuring the adherence of clients to tax regulations and facilitating compliant transfer pricing

transactions. Likewise, Big-N audit firms will ensure that their clients engage in optimal transfer pricing transactions that comply with existing regulations. Investors' confidence in Big-N audit firms' insurance role leads them to consider Big-N clients' transfer pricing transactions less risky than those of non-Big-N clients, as reflected by less fluctuating share prices.

Based on the higher competence, independence, information, and insurance roles of Big-N audit firms compared to non-Big-N audit firms, this research anticipates that engaging Big-N audit firms will decrease the risk of firms engaging in TPAG. Consequently, the research puts forward the following third hypothesis:

H3: Big-N audit firms have an indirect negative effect on firm risk through transfer pricing aggressiveness.

5. Research design

5.1. Variable definitions

5.1.1. Dependent variables

In this research, two dependent variables were utilized, namely TPAG and Firm Risk (*SD_Ret*). TPAG served as the dependent variable for model 1, while *SD_Ret* acted as the dependent variable for both models 2 and 3.

In the case of TPAG, previous research identified several indicators, which included the number of tax havens utilized by the firm (Richardson et al., 2013, Sikka & Willmott, 2010; and; Taylor et al., 2015) and its related party transactions (Nuritomo Utama & Hermawan, 2019; Sari et al., 2020). Firms are considered to engage in more aggressive transfer pricing activities if they use more tax havens and exhibit higher related party transaction values.

This research assesses the TPAG value of firm *i* in year *t* (*TPAG_{it}*) using a multi-step process. Firstly, each TPAG indicator, such as the number of tax havens utilized and related party transactions related to assets, liabilities, sales, and expenses, is sorted from the largest to the smallest. These measures are then divided into four quartiles. Furthermore, the observations are categorized into four groups based on quartile ranking. The observations that fall into the first (top), second, third, and fourth (smallest) groups are scored 4, 3, 2, and 1, respectively. When a firm does not possess one of the TPAG activity indicators in a given year, it is scored as 0. The TPAG value is calculated as the sum of the quartile-level weights assigned to each indicator. The value ranges from a minimum of 2 (reflecting the requirement for a firm to have at least one parent or subsidiary in a tax haven country and engage in one transaction with a related party) to a maximum of 20 (representing the highest score of 4 multiplied by the 5 TPAG indicators). TPAG measurement captured a more comprehensive view of a company's transfer pricing activity than previous measurements, such as Merle et al. (2019) transfer pricing intensity. This process solely employed related party transaction receivables as a proxy for transfer pricing activity.

The classification of tax haven countries in this research follows the methodology proposed by Jones et al. (2018). A country is considered a tax haven, assuming it has a secrecy score equal to or above 65. The list of countries categorized as tax havens is based on the 2018 Financial Secrecy Index provided by TJN (Tax Justice Network – TJN, 2018). The countries included in this list, with secrecy scores equal to or above 65, are presented in Appendix A Table A1 of this research.

Following Utama and Utama (2014), this research classifies related party transactions (RPT) into four categories, including RPT related to assets (RPTA), liabilities (RPTL), sales (RPTS), and expenses (RPTE). However, unlike Utama and Utama (2014), this research employs the original RPT values in

USD instead of ratios. The rationale for this decision is that firms often use tax avoidance strategies to reduce their tax payments. In their financial statement notes, Indonesian firms do not disclose detailed RPT values between parent and subsidiary companies. As a result, this research relies solely on RPT information reported in the financial statement notes, which includes RPT related to associated companies, joint ventures, or companies with the same majority shareholders.

The second dependent variable, Firm risk, is measured by the standard deviation of monthly adjusted market return values (*SD_Ret*). Following the approach of Guenther et al. (2017), the position of the tested stock return volatility value is $t + 1$. The measurement period starts from the first month after the end of the fiscal year and spans 12 months. The following formula operationalizes the standard deviation in the adjusted market return values (*SD_Ret*):

$$SD_Ret_{it+1} = \sigma[R_{it+1} - R_{mt+1}]$$

Where:

σ = standard deviation

R_{it+1} = stock return of firm i in month year $t + 1$

R_{mt+1} = market return in month year $t + 1$

The return (R) is obtained from $\frac{P_t - P_{t-1}}{P_{t-1}}$

Where: P_{t-1} = stock price at the beginning of the month

P_t = stock price at the end of the month

In line with Guenther et al. (2017), this research employs the volatility of a firm's adjusted market returns to measure its risk. This proxy is selected because it is argued to capture the idiosyncratic risk associated with a firm's taxation policies (Ferreira & Laux, 2007). The legal sanctions imposed by the government against TPAG lead to more fluctuating firm future cash disbursements, as indicated by the volatility of future stock returns.

5.1.2. Independent variables

This research employed two independent variables, audit quality (*BIG*) and TPAG. The first hypothesis, represented by regression model 1, examines the effect of audit quality (*BIG*) on the dependent variable. Meanwhile, the second hypothesis, represented by regression model 2, explores the relationship between TPAG and the dependent variable. Both regression models use a similar measurement for TPAG. The measurement of audit quality (*BIG*) relies on a dummy variable approach, where a value of one indicates that a Big-4 audit firm audits the company, and zero depicts otherwise (Bakri & McMillan, 2021; Eshleman & Guo, 2014; Sarhan et al., 2019). Big-4 audit firms are Ernst & Young, PricewaterhouseCoopers, Deloitte, and KPMG.

5.1.3. Mediating variables

In order to assess the indirect impact of audit quality on firm risk through TPAG, the variable (\widehat{TPAG}) was incorporated as a mediator in the regression model (3). The \widehat{TPAG} variable is endogenous, as it is influenced by whether the firm engages Big-N audit firms. In regression model (3), \widehat{TPAG} was measured as the predicted value of the TPAG level of the firm derived from the results of the regression model (1).

5.1.4. Control variables

Regression model (1) incorporates several control variables, namely firm size (*SIZE*), profitability (*PROFIT*), leverage (*LEV*), intangible asset level (*INTANG*), multinational status (*MULTI*), age of the

firm (*AGE*), industry type (*DINDSEC*), worldwide tax system (*WW*), tax rate (*TAXRATE*), and year (*DYEAR*). These control variables have been previously used in the research conducted by Richardson et al. (2013) and Kanagaretnam et al. (2016). On the other hand, regression models (2) and (3) included control variables such as firm size (*SIZE*), pre-tax book income (*PTBI*), leverage (*LEV*), book-to-market ratio (*BTM*), abnormal accruals (*ABN_ACCRUALS*), return (*RETURN*), institutional ownership (*INST_OWN*), number of shares outstanding (*SHARES_OUT*), operating cash flow volatility (*VOL_CFO*), net operating loss carryforwards (*NOLCF*), country (*DCOUNTRY*), and year (*DYEAR*). These control variables have been employed in prior research by Guenther et al. (2017). A summary of the variable descriptions and measurements is shown in Table 1.

5.2. Research models

This present research used the panel data regression models to analyze and test the proposed hypotheses. The research models utilized are outlined as follows:

$$\begin{aligned}
 TPAG_{it} = & \alpha_0 + \alpha_1 BIG_{it-1} + \alpha_2 SIZE_{it-1} + \alpha_3 PROFIT_{it-1} + \alpha_4 LEV_{it-1} + \alpha_5 INTANG_{it-1} \\
 & + \alpha_6 MULTI_{it-1} + \alpha_7 AGE_{it-1} + \alpha_8 DINDSEC_{it-1} + \alpha_9 WW_{it-1} + \alpha_{10} TAXRATE_{it-1} \\
 & + \alpha_{11} DYEAR_{it} + \varepsilon_{it}
 \end{aligned} \tag{1}$$

$$\begin{aligned}
 SD_Ret_{it+1} = & \beta_0 + \beta_1 TPAG_{it} + \beta_2 SIZE_{it} + \beta_3 PTBI_{it} + \beta_4 LEV_{it} + \beta_5 BTM_{it} + \beta_6 ABN_ACCRUALS_{it} \\
 & + \beta_7 RETURN_{it} + \beta_8 INST_OWN_{it} + \beta_9 SHARES_OUT_{it} + \beta_{10} VOL_CFO_{it} + \beta_{11} NOLCF_{it} \\
 & + \beta_{12} DCOUNTRY_{it} + \beta_{13} DYEAR_{it} + \varepsilon_{it}
 \end{aligned} \tag{2}$$

$$\begin{aligned}
 SD_Ret_{it+1} = & \gamma_0 + \gamma_1 BIG_{it} + \gamma_2 \widehat{TPAG}_{it} + \gamma_3 SIZE_{it} + \gamma_4 PTBI_{it} + \gamma_5 LEV_{it} \\
 & + \gamma_6 BTM_{it} + \gamma_7 ABN_ACCRUALS_{it} + \gamma_8 RETURN_{it} \\
 & + \gamma_9 INST_OWN_{it} + \gamma_{10} SHARES_OUT_{it} + \gamma_{11} VOL_CFO_{it} \\
 & + \gamma_{12} NOLCF_{it} + \gamma_{13} DCOUNTRY_{it} + \gamma_{14} DYEAR_{it} + \varepsilon_{it}
 \end{aligned} \tag{3}$$

The proposed hypotheses led to the following expectations from the regression models. First, the regression model (1) predicted a negative value for the coefficient α_1 . This indicated that companies employing Big-N audit firms showed lower TPAG levels than those who did not use them. Second, in the regression model (2), a positive value was predicted for the coefficient β_1 . This suggested that an increase in TPAG resulted in higher firm risk. Third, in the regression model (3), a negative value was anticipated for the coefficient γ_2 . This implied that Big-N audit firms indirectly and negatively impacted firm risk through their influence on TPAG.

Baron and Kenny (1986) and Alodat et al. (2023) stated that a variable is classified as a mediator when it satisfies the following conditions. (1) Independent variables (IV) have significant effects on the dependent variable (DV). (2) IV has significant effects on the mediator. (3) The mediator has a significant effect on the DV. (4) The effects of an IV on the DV diminish after the effects of the mediator are controlled. Therefore, in this research, \widehat{TPAG} was considered a mediating variable assuming it met the following criteria. The variable *BIG* has significant effects on the *SD_Ret*. The variable *BIG* has significant effects on *TPAG*. The *TPAG* has significant effects on *SD_Ret*. And the effects of *BIG* on *SD_Ret* diminished after controlling the mediator (\widehat{TPAG}).

5.3. Data and sample

This research examined the entire population of non-financial publicly listed companies in Indonesia, Malaysia, and Singapore from 2014 to 2018. Since the variable SD_Ret_{t+1} relies on $t+1$ data from the subsequent period. The effective observation period for the analysis was from 2015 to 2017. This starting point was selected because, in September 2013, the OECD issued its Action Plan on Base Erosion and Profit Shifting (BEPS) (OECD, 2017), which required a one-year transition period for member countries to implement regulatory changes related to Big-N audit firms. The regulatory impact of Big-N audit firms is expected to be noticeable from 2015 onwards. Prior to this, there were no standardized international tax regulations regarding transfer pricing, and no

Table 1. Variable description and measurement

Variable (description)	Function	Measurement
TPAG (Transfer Pricing Aggressiveness)	Dependent Variable in equation model (1) and Independent Variable in equation model (2)	The sum of the quartile weight values of each transfer pricing aggressiveness indicator (THAV, RPTA, RPTL, RPTS & RPTE). The lowest (highest) quartile group scored 1 (4), resulting in the highest possible TPAG score of 20.
SD_Ret (Standard Deviation of adjusted market return)	Dependent Variable in equation models (2) and (3)	The standard deviation of monthly adjusted market return values, the calculation starts from the first month after the date of the financial statements.
BIG (Audit by a Big-4 audit firm)	Independent Variable in equation models (1) and (3)	A dummy variable equals one assuming a Big-4 audit firm (Deloitte, PricewaterhouseCoopers, Ernst & Young, or KPMG) audits the firm: and 0 otherwise.
\widehat{TPAG} (Predicted value of firms' transfer pricing aggressiveness level)	Mediating variable in equation model (3)	The predicted value of firms' TPAG level resulting from Equation (1)
SIZE (Firm size)	Control variable in equation models (1), (2), and (3)	The total value of the firm assets, in millions of USD
PROFIT (Firm profitability)	Control variable in equation model (1)	Book profit value before tax divided by total assets
PTBI (Firm performance)	Control variable in equation models (2) and (3)	Book value before tax (pre-tax book income) divided by the total value of the firm's assets at the beginning of the year.
LEV (Leverage)	Control variable in equation models (1), (2), and (3)	The leverage value (long-term debt divided by total assets) of firm <i>i</i> in year <i>t</i> .
INTANG (Intangible)	Control variable in equation model (1)	The value of the ratio of R&D expenditure and intellectual property (such as patents, royalties, etc.) divided by the total assets of firm <i>i</i> in year <i>t</i> .
MULTI (Multinationality)	Control variable in equation model (1)	The number of subsidiaries and/or firm holdings <i>i</i> in year <i>t</i> is domiciled abroad.
AGE (Age)	Control variable in equation model (1)	The age of firm <i>i</i> in year <i>t</i> .
DINDSEC (Industry Sector)	Control variable in equation model (1)	A dummy variable equals one for firms in the basic and chemical industry category and 0 otherwise (based on the two-digit GICS code).
WW (Worldwide)	Control variable in equation model (1)	A dummy variable for the state tax system approach equals one if the home country tax system uses a worldwide approach and 0 if the home country tax system uses a territorial approach.
TAXRATE (Tax Rate)	Control variable in equation model (1)	The statutory tax rate in the country of origin of firm <i>i</i> in year <i>t</i> .

(Continued)

Table 1. (Continued)

Variable (description)	Function	Measurement
BTM (Book to Market)	Control variable in equation models (2) and (3)	The ratio between the book value of equity and market value (market price multiplied by the total number of ordinary shares outstanding) in firm <i>i</i> in year <i>t</i> .
ABN_ACCRUALS (Abnormal Accruals)	Control variable in equation models (2) and (3)	The absolute values of discretionary accruals were estimated using the Kothari et al. (2005) firm <i>i</i> in year <i>t</i> .
RETURN (Return)	Control variable in equation models (2) and (3)	Annual adjusted market return of firm <i>i</i> in year <i>t</i> .
INST_OWN (Institutional Ownership)	Control variable in equation models (2) and (3)	The average value of institutional ownership in firm <i>i</i> in year <i>t</i> .
SHARES_OUT (Outstanding shares)	Control variable in equation models (2) and (3)	The logarithmic value of the number of outstanding shares owned by firm <i>i</i> in year <i>t</i> .
VOL_CFO (Volatility of Cash Flow from Operating Activities)	Control variable in equation models (2) and (3)	The standard deviation of operating cash flow divided by the total asset value at the beginning of firm <i>i</i> in year <i>t</i> .
NOLCF (Net Operating Loss Carry Forward)	Control variable in equation models (2) and (3)	The amount of compensation for fiscal losses divided by the beginning total assets of firm <i>i</i> in year <i>t</i> .
DCOUNTRY (Country)	Control variable in equation models (2) and (3)	A country dummy variable, 1 for Indonesia, and 0 otherwise.
DYEAR (Year)	Control variable in equation models (2) and (3)	Variable dummy year, 1 for the firm year in the 2015 observation, and 0 for the others.

mutual agreements existed between the G20 and OECD member countries to address tax regulation disparities between countries.

The financial and audit firm data used in this research was sourced from multiple platforms, such as the Thomson Reuters Eikon database, the stock exchange, and the firms' websites. Tax haven country data from the 2018 Financial Secrecy Index released by the Tax Justice Network – TJN (2018) was also utilized. Data on tax enforcement strength was acquired from the Global Competitiveness Report by the World Economic Forum. Finally, share price data were collected from the official websites of the respective country stock exchange.

In order to be selected as samples for this research, firms needed to meet the following criteria. They must be listed on the Indonesian, Malaysian, and Singaporean Stock Exchanges, non-financial firms, must have complete financial statements, and need to have a parent company, at least one subsidiary, or a related party located in a tax haven country (Jones et al., 2018). These companies must engage in related party transactions and have all the required data for analysis. As a result, 490 firms (84 Indonesian, 216 Malaysian, and 190 Singaporean firms) were selected as the research sample, resulting in 1,470 firm-year observations. The step-by-step process of the sample selection is shown in Table 2.

Table 2. Sample Selection

Details	Indonesia	Malaysia	Singapore	Total
Publicly listed firms in 2014–2018	614	924	702	2,240
Less:				
• Financial firms	(96)	(36)	(31)	(163)
• Firms with incomplete financial statements (the reporting year is incomplete because of a change in the reporting period, listed or delisted in the middle of the observation period, or financial reports are not available)	(137)	(97)	(143)	(377)
• Firms with no parent, subsidiary, or related party in a tax haven country	(292)	(540)	(284)	(1,116)
• Firms were not engaging in related party transactions.	(2)	(21)	(29)	(52)
• Firms that do not have the required data	(3)	(14)	(25)	(42)
Total Sample (firm)	84	216	190	490
Observation period (year)	3	3	3	3
Number of observations (firm-year)	252	648	570	1,470

5.4. Descriptive statistics, bi-variate correlations, and diagnostics

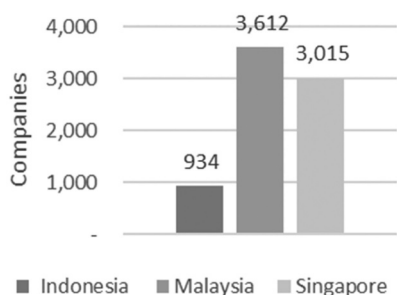
Descriptive statistics of the sample data are shown in Table 3, with a mean *TPAG* value of 8.41, indicating that, on average, the sampled firms were categorized in the second quartile from the bottom. In other words, the observation firms have relatively low *TPAG*. Approximately 49.1% of the total sample firms hire Big-4 audit firms. On average, the sampled firms have 11 parent or subsidiary organizations located abroad and are 32 years old. The average book-to-market (*BTM*) ratio is 1.396, suggesting that, in general, the sampled firms have market values lower than their book values.

Table 4 shows the distribution of auditors hiring across different countries. According to the data, Indonesia has the highest proportion of firms (56%) that hire Big-4 audit firms, whereas Singapore has the lowest proportion (46%). The overall sample of firms indicates a relatively balanced proportion, with approximately 49% hiring Big-4 audit firms as opposed to 51%.

The TPAG value is obtained from the total quartile scores of the TPAG indicator, namely the number of parent/subsidiary companies in tax haven countries (THAV), the value of related party transactions related to assets (RPTA), liabilities (RPTL), sales (RPTS), and expenses (RPTE). Table 5, Graph 1, and Graph 2 show the data and graphic illustration of the distribution of the five TPAG indicators in each country.

Graph 1. THAV Data Distribution.

Notes: THAV = the number of parent/subsidiary firms in tax haven countries



Graph 2. Related Party Transaction Data Distribution.

Notes: RPTA = the value of related party transactions related to assets (USD); RPTL = the value of related party transactions related to liabilities (USD); RPTS = the value of related party transactions related to sales (USD); RPTE = the value of related party transactions related to expense (USD).

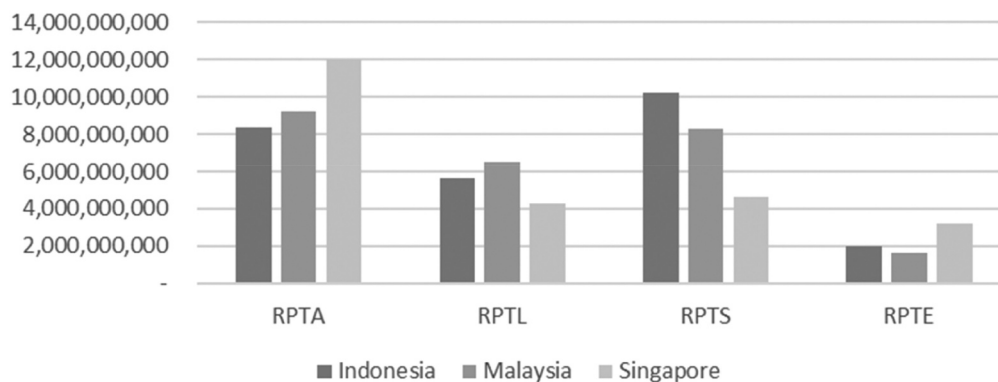


Table 5 and Graph 1 show that Malaysian companies have the most parent or subsidiary companies in tax haven countries, with 3,612 companies. On the other hand, Indonesian companies have the lowest number of such firms, with only 934. Regarding related party transactions, Table 5 and Graph 2 revealed that Indonesian companies have the highest related party sales (RPTS) value at USD 10,213,988,713. Malaysian companies, on the other hand, have the highest value of related party liabilities (RPTL) at USD 6,512,938,432. Singaporean companies have the highest value of related party assets (RPTA) at USD 12,036,617,860 and related party expenses (RPTE) at USD 3,194,708,535. Overall, Indonesian companies have the highest total RPT values of USD 26,260,758,773.

Table 6 shows the Pearson correlation table of all research variables. It indicates that BIG (Big-4) positively relates to TPAG (the correlation coefficient between these variables is positive and

Table 3. Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
TPAG	1,470	8.408	4.104	2	20
SD_Ret	1,470	0.105	0.069	0.027	0.313
BIG	1,470	0.491	0.500	0	1
SIZE	1,470	946.668	133.394	15	6,414
PROFIT	1,470	0.026	0.082	-0.215	0.172
PTBI	1,470	0.028	0.083	-0.182	0.199
LEV	1,470	0.111	0.119	0	0,423
INTANG	1,470	0.020	0.045	0	0,187
MULTI	1,470	11.138	11.912	1	47
AGE	1,470	32.433	18.445	8	82
DINDESEC	1,470	0.015	0.121	0	1
WW	1,470	0.612	0.487	0	1
TAXRATE	1,470	0.217	0.038	0.17	0.25
BTM	1,470	1.396	1.009	0.081	4.176
ABN_ACCRUALS	1,470	0.074	0.072	0.004	0.314
RETURN	1,470	-0.006	0.386	-0.596	1.288
INST_OWEN	1,470	0.326	0.469	0	1
SHARES_OUT	1,470	8.891	0.633	7.902	10.269
VOL_CFO	1,470	0.058	0.040	0.119	0.160
NOLCF	1,470	0.031	0.063	0	0.252

Notes: All continuous variables are winsorized by fiscal year at the 5th and 95th percentile. TPAG = Transfer Pricing Aggressiveness, SD_Ret = Standard Deviation of adjusted market return, BIG = Audit by a Big-4 audit firm, SIZE = Firm size, PROFIT = Firm profitability, PTBI = Firm performance, LEV = Leverage, INTANG = Intangible, MULTI = Multinationality, AGE = Age, DINDESEC = Industry sector, WW = Worldwide, TAXRATE = Tax rate, BTM = Book to market, ABN_ACCRUALS = Abnormal accruals, RETURN = Return, INST_OWEN = Institutional ownership, SHARES_OUT = Outstanding shares, VOL_CFO = Volatility of cash flow from operating activities, NOLCF = Net operating loss carry forward. See Table 1 for more detailed variable definitions.

Table 4. Big -4 Usage Distribution

Country	Big-4		Non-Big-4		Total	
	n	%	n	%	n	%
Indonesia	141	56%	111	44%	252	100%
Malaysia	317	49%	331	51%	648	100%
Singapore	264	46%	306	54%	570	100%
Total	722	49%	748	51%	1.470	100%

Notes: Big-4 = Ernst & Young, PricewaterhouseCoopers, Deloitte, and KPMG; n = number of firm-year observations.

Table 5. Distribution of the value of the transfer pricing aggressiveness indicator

Country	n	THAV	RPTA	RPTL	RPTS	RPTE	Total RPT
Indonesia	252	934	8,394,607,017	5,653,930,315	10,213,988,713	2,005,815,193	26,268,341,238
Malaysia	648	3,612	9,232,150,614	6,512,938,432	8,319,471,040	1,605,792,716	25,670,352,803
Singapore	570	3,015	12,036,617,860	4,257,637,503	4,664,017,495	3,194,708,535	24,152,981,393

Notes: n = number of firm-year observations; THAV = the number of parent/subsidiary firms in tax haven countries; RPTA = the value of related party transactions related to assets (USD); RPTL = the value of related party transactions related to liabilities (USD); RPTS = the value of related party transactions related to sales (USD); RPTE = the value of related party transactions related to expense (USD).

Table 6. Pearson correlation coefficients

Variable (n = 1,470)	1	2	3	4	5	6	7	8	9	10	11
1. TPAG	1										
2. SD_Ret	-0.210***	1									
3. BIG	0.187***	-0.161***	1								
4. SIZE	0.354***	-0.213***	0.242***	1							
5. PROFIT	0.140***	-0.396***	0.164***	0.135***	1						
6. PTBI	0.110***	-0.363***	0.124***	0.141***	0.649***	1					
7. LEV	0.138***	-0.031	0.183***	0.400***	-0.029	-0.054**	1				
8. INTANG	0.055**	0.022	0.005	0.074***	-0.034	-0.054**	0.054**	1			
9. MULTI	0.324***	-0.111***	0.059*	0.381***	0.027	0.037	0.128**	0.158***	1		
10. AGE	0.219***	-0.216***	0.128***	0.232***	0.166***	0.185***	0.080**	-0.048*	0.160***	1	
11. DINDSEC	-0.027	-0.032	0.047*	-0.053**	-0.005	0.012	-0.052**	0.009	-0.091***	0.062**	1
12. WW	0.045	-0.141***	0.045*	-0.010	0.185***	0.163***	0.028	-0.053**	-0.212***	0.017	0.098***
13. TAXRATE	0.046**	-0.140***	0.048*	-0.006	0.188***	0.163***	0.034	-0.056**	-0.219***	0.015	0.097***
14. BTM	-0.021	0.191***	-0.092***	-0.112***	-0.209***	-0.241***	-0.021	-0.093***	-0.015	0.006	0.062**
15. ABN_ACCRUAL	-0.139***	0.225***	-0.109***	-0.147***	-0.227***	-0.259***	-0.069***	-0.005	-0.106*	-0.149*	-0.047
16. RETURN	-0.061**	-0.022	-0.040	-0.024	0.115***	0.299***	-0.114***	-0.024	-0.015	0.046	0.039
17. INST_OWN	0.094***	-0.068***	0.101***	0.134***	-0.016	-0.019	0.030	0.047	0.166*	0.022	0.022
18. SHARES_OUT	0.240***	-0.001	0.152***	0.521***	0.021	0.044	0.392***	0.062*	0.140*	0.045	-0.088*
19. VOL_CFO	-0.173***	0.246***	-0.147***	-0.293***	-0.138***	-0.130***	-0.184***	-0.049	-0.173*	-0.185*	-0.031
20. NOLCF	0.004	0.040	-0.143***	-0.154***	-0.145***	-0.145***	-0.129***	0.058*	-0.022	-0.027	0.067*

(Continued)

Table 6. (Continued)

Variable	12	13	14	15	16	17	18	19	20
12. WW	1								
13. TAXRATE	0.996***	1							
14. BTM	-0.092***	-0.087***	1						
15. ABN_ACCRUAL	-0.130***	-0.132***	-0.123***	1					
16. RETURN	0.050	0.028	-0.238***	0.003	1				
17. INST_OWN	-0.176***	-0.183***	0.014	-0.023	0.020	1			
18. SHARES_OUT	0.149***	0.164***	-0.172***	-0.029	-0.083***	-0.014	1		
19. VOL_CFO	-0.112***	-0.110***	-0.085***	0.323***	-0.054**	-0.072***	-0.152***	1	
20. NOLCF	0.179**	0.171***	0.005	0.059**	0.003	-0.035	-0.201***	0.113***	1

Notes: Significant at *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$. Dummy variables for countries are not displayed for the sake of simplicity. TPAG = Transfer Pricing Aggressiveness, SD_Ret = Standard Deviation of adjusted market return, BIG = Audit by a Big-4 audit firm, SIZE = Firm size, PROFIT = Firm profitability, PTBI = Firm performance, LEV = Leverage, INTANG = Intangible, MULTI = Multinationality, AGE = Age, DINDSEC = Industry sector, WW = Worldwide, TAXRATE = Tax rate, BTM = Book to market, ABN_ACCRUALS = Abnormal accruals, RETURN = Return, INST_OWN = Institutional ownership, SHARES_OUT = Outstanding shares, VOL_CFO = Volatility of cash flow from operating activities, NOLCF = Net operating loss carry forward. See Table 1 for more detailed variable definitions.

significant). Therefore, firms hiring Big-N audit firms engage in more *TPAG* transactions than those not seeking their services.

Table 6 also suggests a negative and significant correlation between *TPAG* and firm risk (*SD_Ret*), as the correlation coefficient between these two variables is negative and significant ($\alpha = 5\%$). The negative correlation coefficient indicates that as firms engage in more *TPAG* mechanisms, their level of risk decreases. The correlation analysis initially suggests that hiring Big-N (Big-4) audit firms is associated with a reduction in firm risk. However, multivariate analysis needs to investigate these univariate relationships further.

The equation models (1) and (2) are estimated using the random-effect model (REM) since the nature of the data does not change over time. Equation model (3) is estimated using two-stage least squares (2SLS) methodology. Finally, robust standard errors were used to obtain unbiased standard errors.

6. Empirical results and discussion

6.1. Regression results

Hypothesis 1 predicts that MNCs audited by Big-N audit firms exhibit lower *TPAG* than those not audited by them (Big-N audit firms negatively affect *TPAG*). Table 7 column A displays the results of this hypothesis testing, indicating that the Big-N coefficient is positive and significant ($\alpha = 1\%$).

The results showed that MNCs audited by Big-N audit firms exhibited higher *TPAG* than those not audited by Big-N audit firms. Table 7 column A also shows *SIZE*, *PROFIT*, *MULTI*, and *AGE* as control variables having positive and significant coefficients ($\alpha = 1\%$, 10% , 1% , and 1% , respectively). The results support the research prediction and prior results that larger firms, more profitable firms, those with more foreign-based subsidiaries/parents, and more experience firms exhibit greater *TPAG* (Rego, 2003; Richardson et al., 2013; Slemrod, 2001).

Hypothesis 2 predicts that *TPAG* positively affects firm risk. Table 7 column B presents the results of the hypothesis testing with the *TPAG* coefficient possessing negative and significant ($\alpha = 1\%$) values. Therefore, firms engaging in more *TPAG* transactions exhibit lower risk. Regarding the control variables, Table 7 Column B shows that the *SIZE* and *PTBI* coefficients are negative and significant ($\alpha = 1\%$), and the *BTM* and *VOL_CFO* coefficients are positive and significant ($\alpha = 1\%$). These findings support previous research that larger firms (*SIZE*) have lower return volatility (Guenther et al., 2017). Further, firms with better performance (*PTBI*) exhibit lower risk (Guenther et al., 2017; Rego, 2003). Lastly, firms with higher growth opportunity (*BTM*) and operating cash flow volatility (*VOL_CFO*) have higher stock return volatility (Guenther et al., 2017).

Hypothesis 3 predicts that Big-N has an indirect negative effect on firm risk through *TPAG*. Before testing hypothesis 3, Big-N was initially determined to examine whether it directly affects firm risk, as shown in Table 7 column C. The results show that the Big-N coefficient is negative and significant ($\alpha = 10\%$), implying that MNCs audited by Big-N audit firms have lower firm risk than those not audited by Big-N audit firms.

Finally, to investigate whether Big-N audit firms indirectly affect firm risk through *TPAG*, variable \widehat{TPAG} was included in the regression analysis. Table 7, column D presents the results of the hypothesis testing. The \widehat{TPAG} coefficient is negative and significant ($\alpha = 5\%$), and variable *BIG* becomes insignificant. The result suggests that \widehat{TPAG} is a mediating variable, and Big-N has an indirect negative effect on firm risk through *TPAG*.

Table 7. Regression Estimations

Variable	Dependent Variable			
	A (Model 1)	B (Model 2)	C	D (Model 3)
	TPAG	SD_Ret	SD_Ret	SD_Ret
Independent variable coefficients:				
<i>BIG</i>	.836(2.90)*** (2.90)***		-0.008 (-1.84)*	-0.004 (-1.26)
<i>TPAG</i>		-0.002 (-4.57)***		
Mediating variable coefficient:				
<i>TPAG</i>				-0.004 (-2.39)**
Control variable coefficients:				
<i>SIZE</i>	5.7e-4(4.41)*** (4.41)***	-6.5e-06 (-4.52)***	-7.5e-06 (-5.09)***	-4.4e-06 (-3.07)***
<i>PROFIT</i>	1.727(1.84)* (1.84)*			
<i>PTBI</i>		-0.184 (-6.46)***	-0.188 (-6.61)***	-0.223 (-8.20)***
<i>LEV</i>	-.891(-1.18) (-1.18)	0.005 (0.25)	0.007 (0.34)	0.003 (0.16)
<i>INTANG</i>	1.829(.74) (0.74)			
<i>MULTI</i>	.048(3.09)*** (3.09)***			
<i>AGE</i>	.021(1.81)* (1.81)*			
<i>DINDSEC</i>	-.939(-1.62) (-1.62)			
<i>WW</i>	.042(.04) (0.04)			
<i>TAXRATE</i>	6.929(.47) (0.47)			
<i>BTM</i>		0.012 (4.63)***	0.012 (4.43)***	0.012 (5.78)***
<i>ABN_ACCRUAL</i>		0.025 (0.90)	0.028 (1.00)	0.067 (2.44)**
<i>RETURN</i>		0.013 (2.40)**	0.013 (2.47)**	0.021 (3.92)***
<i>INST_OWN</i>		-0.002 (-0.45)	-0.002 (-0.51)	-0.002 (-0.65)
<i>SHARES_OUT</i>		0.015 (2.23)**	0.013 (1.91)*	0.016 (3.17)***
<i>VOL_CFO</i>		0.257 (4.47)***	0.265 (4.60)***	0.258 (5.17)***
<i>NOLCF</i>		0.032 (0.84)	0.016 (0.43)	0.030 (0.86)

(Continued)

Table 7. (Continued)

Constant	4.665(1.86)* (1.86)*	-0.021 (-0.34)	-0.014 (-0.23)	-0.020 (-0.45)
DCOUNTRY		Yes	Yes	Yes
DYEAR	Yes	Yes	Yes	Yes
Adj.R2	.215	0.378	0.370	0.252
Model	REM	REM	REM	2SLS

Notes: Significance levels at *** $p < 0.01$. ** $p < 0.05$ and * $p < 0.1$; DV = Dependent Variable, TPAG = Transfer Pricing Aggressiveness, \hat{TPAG} = predicted value of TPAG, SD_Ret = Standard Deviation of adjusted market return, BIG = Audit by a Big-4 audit firm, SIZE = Firm size, PROFIT = Firm profitability, PTBI = Firm performance, LEV = Leverage, INTANG = Intangible, MULTI = Multinationality, AGE = Age, DINDSEC = Industry sector, WW = Worldwide, TAXRATE = Tax rate, BTM = Book to market, ABN_ACCRUALS = Abnormal accruals, RETURN = Return, INST_OWN = Institutional ownership, SHARES_OUT = Outstanding shares, VOL_CFO = Volatility of cash flow from operating activities, NOLCF = Net operating loss carry forward, DCOUNTRY = Country, DYEAR = Year, REM = Random Effect Model; 2SLS = Two Stage Least Square. Data is winsorized by fiscal year at the 5th and 95th percentiles (winsorizing at the 1st and 99th percentiles produces similar results). See Table 1 for more detailed variable definitions.

6.2. Discussion

This research formulates hypotheses based on the assumption that companies engage in TPAG opportunistically, thereby increasing risk and possibility of harm to them. However, the empirical testing of hypothesis 1 yields result contrary to expectations, as it indicates that MNCs hiring high-quality (Big-N) audit firms exhibit higher levels of TPAG than those that do not engage such firms. Furthermore, the testing of hypothesis 2 revealed that more TPAG schemes are associated with a reduction in firm risk. These findings show that investors perceive firms' TPAG positively. In other words, investors consider TPAG to increase firm value.

The results can be explained by arguing that firms engage in TPAG practices efficiently. According to the efficient contracting hypothesis, transactions are considered efficient when they contribute to an increase in firm value (Holthausen, 1990). Managers can strategically employ transfer pricing activities and consider tax implications to enhance firm value (Christie & Zimmerman, 1994). While these transactions may result in wealth losses for some contracting parties, they can benefit others, leading to an overall increase in the wealth of all parties involved. The market reacts positively to these transactions, suggesting that the TPAG of firms can be viewed as efficient.

The findings suggest that TPAG activities are potentially beneficial for shareholder value. In this context, Big-N audit firms, acting as monitoring mechanisms for companies, ensure that their clients effectively utilize their knowledge of international taxes to maximize the benefits for their shareholders. Therefore, MNCs that engage Big-N audit firms are more likely to exhibit higher TPAG levels than those that do not employ such firms. This research confirms the findings of McGuire et al. (2012) that auditor industry experts possess the necessary skills to identify and handle risks associated with tax avoidance in their specific domain of expertise.

Furthermore, the results of testing hypothesis 3 showed a negative relationship between Big-N audit firms and firm risk, both directly and indirectly, through the transfer pricing mechanism. According to the typology mediation relationship of Zhao et al. (2010), this process is referred to as complementary mediation. This result indicates that when the direct effect of audit quality on firm risk is tested without considering other potential variables, there is a possibility of an "omitted mediator." In other words, the direct effect of audit quality on firm risk has not accounted for the influence of other variables. This research empirically shows that such a direct test should consider TPAG because this variable likely mediates the relationship between audit quality and firm risk.

6.3. Further tests

Additional sensitivity analyses were conducted to ensure result reliability. Firstly, an alternative measure for the independent variable *BIG* was considered by including Big-10 audit firms instead of solely focusing on Big-4 audit firms. Secondly, alternative time windows were used to calculate stock return volatility. The *BIG* variable relaxes by scoring one when the company hires a Big-10 audit firm (instead of a Big-4 audit firm) to accommodate the opinion that the second-tier audit office also has good audit quality (Cassel et al., 2013). Following Hidayat (2019), data from www.accountancyage.com was used to identify the ten largest audit firms worldwide (Ernst & Young, PricewaterhouseCoopers, Deloitte, KPMG, BDO International, RSM, Grant Thornton International, Crowe Global, Nexia International, and Baker Tilly International). These sensitivity analyses for hypotheses 1 and 3 are similar to the main test results, which are not tabulated.

In the second sensitivity test, the calculation of stock return volatility was adjusted. Instead of starting from the first month after the financial statement date or the end of the fiscal year (Guenther et al., 2017), the calculation started from the first month following the deadline for submitting the annual financial statements to the stock exchange authority. Similar to the main test results, the sensitivity analyses for hypotheses 2 and 3 produced consistent results, indicating the robustness of the *TPAG* measure. However, the detailed results were not included in the table. These additional sensitivity tests enhance the reliability of our conclusions by considering different periods and incorporating the timing of financial statement submissions to capture potential market reactions accurately.

The potential endogeneity bias arising from the relationship between the dependent and explanatory variables, as well as their impact on the hiring of Big-N audit firms, related party transactions, and firm risk, was recognized in this research. To mitigate this bias, the generalized method of moments (GMM) model was employed (Bakri & McMillan, 2021; Ullah et al., 2018). The GMM model results, not presented in the table, indicate that by including the lagged value of the dependent variable as an independent variable in the model (3), both the Sargan Test and the Arellano-Bond test suggest the presence of ongoing endogeneity issues within the model. This condition suggests a relationship between the examined variables and the firm's past conditions. However, despite these endogeneity concerns, the GMM analysis reveals that the variable representing *TPAG* has a significant negative coefficient, while the *BIG* variable is found to be statistically insignificant. These results are consistent with the results of hypothesis 3, suggesting that audit quality indirectly influences firm risk through firm *TPAG*.

7. Summary and conclusion

This research aims to accomplish the following objectives: 1) to analyze the impact of audit quality on *TPAG*, 2) to investigate the relationship between *TPAG* and firm risk, and 3) to examine the indirect influence of audit quality on firm risk through *TPAG*. The audit quality proxy used in this research is Big-N audit firms, widely recognized as a measure of high audit quality (Bakri & McMillan, 2021; DeAngelo, 1981; Eshleman & Guo, 2014; Sarhan et al., 2019). By analyzing a sample of firms from three Southeast Asian countries, Indonesia, Malaysia, and Singapore, this research revealed that MNCs that engage Big-N audit firms tend to exhibit higher *TPAG* levels than those not audited by Big-N firms. Furthermore, firms with more *TPAG* practices tend to experience lower levels of firm risk. This result can be attributed to the efficiency of their transfer pricing transactions, which increase firm value and elicit positive market reactions.

Additionally, this research provides empirical evidence that high-quality audits, such as those conducted by Big-N audit firms, have a direct or indirect effect on reducing firm risk, with *TPAG* serving as a mediating factor. The results highlight the importance of considering *TPAG* when analyzing the relationship between audit quality (Big-N audits) and firm risk.

This research offers several practical and theoretical implications. Firstly, it contributes to the existing literature on *TPAG* by highlighting the role of audit quality, specifically Big-N audits, in

determining and increasing TPAG. These results support previous research by Jones et al. (2018), McGuire et al. (2012), and Sikka and Hampton (2005), expanding the understanding of the factors influencing transfer pricing behaviour. Secondly, this research shows that TPAG has a negative impact on firm risk, suggesting the market perceives firm TPAG practices as efficient and value-increasing (Christie & Zimmerman, 1994; Holthausen, 1990). This result indicates that companies need to consider transfer pricing's benefits in their strategies. Finally, this research documents that audit quality reduces firm risk through TPAG (a complementary mediation) (Zhao et al., 2010). The results reveal that Big-N audit firms play the information and insurance roles effectively. Consequently, analysts and investors are more confident that companies hiring Big-N audit firms have better quality and lower risk.

This research acknowledges several limitations that should be considered. Firstly, the analysis is based on related party transactions reported in the notes to the financial statements, specifically those involving associate companies, joint ventures, or companies with the same major shareholders. As a result, related party transactions between parents and subsidiaries are not included in the analysis. This limitation is particularly significant for Indonesian companies, whose financial statement notes do not provide detailed information on related party transactions between parents and subsidiaries. Future research should incorporate such transactions to enhance the robustness and reliability of the results. Secondly, the sample for this research is limited to companies from three Southeast Asian countries. While these countries are chosen to represent developing country conditions, it restricts the generalizability of the results. Future research can expand the analysis by including firms from developed countries and comparing the results with those obtained in this research. Analyzing a more diverse and extensive sample of firms would enhance the reliability and validity of the test results.

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Appendix

Table A1. Tax haven countries list

No.	Country Name	No.	Country Name
1	Andorra	27	Marshall Islands
2	Anguilla	28	Mauritius
3	Antigua and Barbuda	29	Monaco
4	Aruba	30	Montserrat
5	Bahamas	31	Nauru
6	Bahrain	32	Netherlands
7	Belize	33	Panama
8	Bolivia	34	Paraguay
9	Botswana	35	Philippines
10	British Virgin Islands	36	Puerto Rico
11	Brunei Darussalam	37	Romania
12	Cayman Islands	38	Samoa
13	Costa Rica	39	Singapore
14	Dominica	40	Saudi Arabia
15	Dominican Republic	41	Seychelles
16	Gambia	42	St. Kitts and Nevis
17	Gibraltar	43	St. Lucia
18	Grenada	44	St. Vincent and The Grenadines
19	Guernsey	45	Switzerland
20	Hong Kong	46	Taiwan
21	Kenya	47	Thailand
22	Lebanon	48	Turki
23	Liberia	49	Turks and Caicos Islands
24	Liechtenstein	50	Ukraine
25	Macao	51	Vanuatu
26	Maldives	52	Venezuela