Ownership Structure and Tax Avoidance: An empirical analysis of listed Indonesian mining companies

Master Thesis

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ABSTRACT

Indonesia's mining industry substantially contributes to the nation's GDP, revenue, export and employment. However, the country experiences illicit financial flows partly caused by tax avoidance of mining firms, leading to less available funds for other investments. Tax avoidance does not occur without the knowledge of specific firm parties, such as controlling owners. The thesis therefore empirically investigates the impact of ownership structure on tax avoidance of listed Indonesian mining firms. The unit of analysis is 34 mining firms listed in the Indonesian stock exchange (IDX) from 2004 to 2018. Since tax avoidance cannot be measured directly, this thesis uses cash effective tax rate, effective tax rate and profit before tax as proxies for tax avoidance. The independent variables are the following ownership types: family, state, domestic corporate, domestic institutional, and foreign. Regression results, explaining the variation in tax avoidance between firms and between years, show that ownership type has a significant effect on the proxies regarding tax avoidance. By this, this thesis finds that ownership types domestic institutional and foreign positively influence tax avoidance, while family, state and domestic corporate ownership show a negative effect. Ownership structure is shown to be an important tax-avoidance contributing factor. These findings could benefit government policies aiming to reduce illicit financial flows and to improve the social welfare with tax revenue, especially in emerging countries such as Indonesia.

Keywords: *ownership structure, tax avoidance, profit before tax, effective tax rate, cash effective tax rate, two-way error component model, first-difference, Indonesia*

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Content

1 INTRODUCTION

This research thesis studies the relationship between ownership structure and tax avoidance. In order to gain an understanding of the imperative of this relationship, this chapter starts with background information on the subject's ownership structure and tax avoidance (Section 1.1). Next, the thesis's objectives and contribution are given (Section 1.2) followed by the thesis's outline (Section 1.3).

1.1 Background

'Taxes, after all, are dues that we pay for the privileges of membership in an organized society.' – Franklin D. Roosevelt

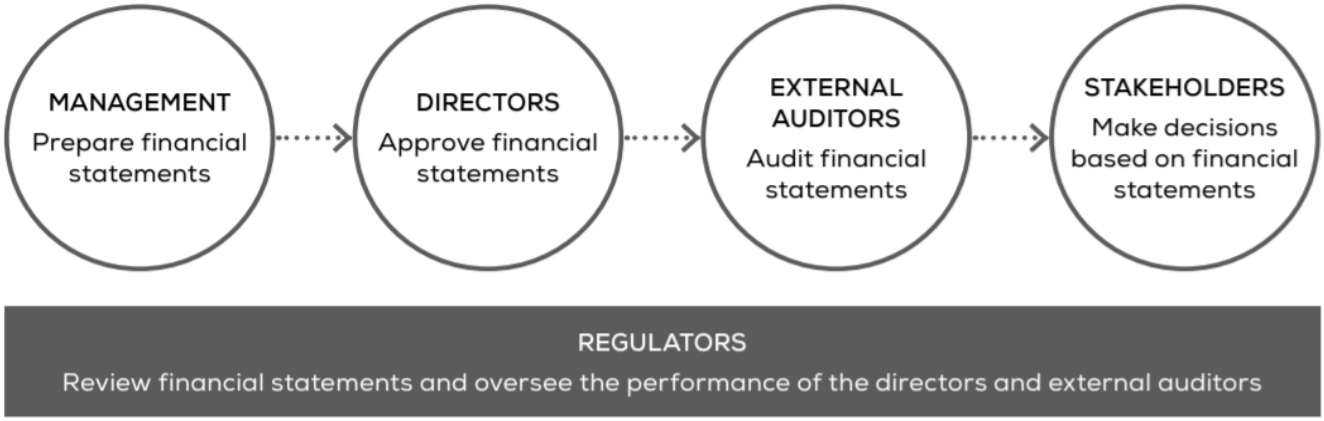
Roosevelt has a crucial point. Tax payments should be seen as not only the individuals' duty to contribute to the societal privileges, corporations as well should not be economic free riders and enjoy the society and citizenship without the responsibility and costs individuals have to face. Also, they should consider tax payments as a corporate social responsibility in order to enable an organized society and be part of it.

Whereas one might think that the director of the firm has most of the responsibilities and decision-making power, decisions regarding the firm's strategies such as tax management strategy and goals are not only determined by them. Also the board, managers and controlling shareholders play a part in that. While the manager is responsible for the firm's resource allocation (Minnick & Noga, 2010) and financial reporting, the board monitors the actions and has an oversight on the manager's actions (Chan et al., 2013). Controlling shareholders check and count on the financial reports, in order to make decisions[1]. Tax reporting and decisions mentioned in the reports cannot be overlooked by them. Thus, tax management and tax avoidance, which is the term for legally avoiding tax payments (Hope et al, 2013), do not happen without the knowledge and engagement of those parties.

Figure 1 illustrates the responsibilities of different parties regarding the financial reports, showing that many are aware of tax decisions and by this they can play a role in tax avoidance.

[1] Chartered Accountants Australia and New Zealand & Association of Chartered Certified Accountants (2017). Directors' responsibilities for financial statements. In Finance and Management newsletter Retrieved from http://www.accaglobal.com/content/dam/ACCA_Global/professional-insights/Directors-responsibilities-for-financial-reporting/pi-Directors-Guide-to-Financial-Reporting.pdf

Figure 1. Financial Reporting Responsibilities (Chartered Accountants Australia and New Zealand & Association of Chartered Certified Accountants, 2017)



The traditional view on tax avoidance states that tax avoidance is considered as value enriching because the saved taxes can be returned to shareholders (Bayar et al., 2018; Sari et al., 2017). Hence tax avoidance can benefit the firm by saving revenues. Firm directors partially even expect taxes to be avoided (Christensen & Murphy, 2004). However, there is also the agency standpoint of tax avoidance. Due to agency conflicts, saved taxes might not be returned to all firm's shareholder. Insiders such as managers or shareholders who control most shares of the firm (controlling shareholders) might gain more benefits of those avoidance strategies compared to minority shareholders, e.g., due to their decision power and control over the corporate resources (Bradshaw et al., 2016; Tong et al., 2017; Chan et al., 2016). With tax avoidance, the cash flow retained, benefits mostly the controlling shareholders, who then misappropriate funds and hurt minority shareholders. The wealth of the firm is then tunnelled solely to the controlling ones (Chan et al., 2016).

Not only the divergence between majority and minority shareholders seems to influence firm's tax management. There are also differences among the type of shareholders due to differences among their resource endowments, identity and concentration, which compose the firm's ownership structure (Saleh et al., 2017). Different kind of owners might have different incentives for the firm (Douma et al., 2006). This difference in incentives and goals lead to agency conflicts according to the agency theory, which might impact tax payment decisions (Chan et al., 2016; Desai & Dharmapala, 2009).

1.2 Research Objective and Contribution

Tax avoidance is an inherent part of each firm, and tax avoidance behaviour can be partly explained by the firm's ownership structure. This is why, the studies of ownership structure and tax avoidance could provide additional insights into the spectrum of tax avoidance and reasoning of its practice other then increasing share holder value. Hence, this thesis hypothesizes that tax avoidance is linked to the ownership structure of firms. The unit of analysis for this research are Indonesia's publicly traded mining firms.

Indonesia's mining industry is an interesting subject to study. On the one hand, the mining industry contributes to a large extent towards state revenues (Winzenried et al., 2018), but at the same time there seems to be an imbalance between the state's revenue and economic development, caused to a large extent by illicit financial flows and tax crimes in the mining sector (Saputra & Abdullah, 2015). In 2013, tax evasion (illegally avoiding taxes) and avoidance (legally avoiding taxes) (Hope et al, 2013) lead to the event that the tax ratio of the mining sector to GDP, which includes the income tax, company tax, and VAT, reached only 9.4%, which is below the national average 10%. Because of such low rates, the mining sector in Indonesia accounts for 10.5 % of total illicit financial flows (Saputra & Abdullah, 2015). Investigating the owners' role on tax avoidance as determinants can help to judge future share allocations and restrictions better. Harm to other shareholders and losses in state revenues caused by tax avoidance for instance, can be avoided.

The main objective of this thesis is to empirically analyse whether the type of owner affects tax avoidance in Indonesian mining companies listed on IDX (Indonesian Stock Exchange).
Therefore, the thesis's research question is:

"What is the effect of ownership structure on tax avoidance of listed mining firms in Indonesia?"

This study makes three contributions to the literature. Previous studies covered firms' ownership structure and tax avoidance, but there is still little empirical evidence on whether specific type of owners have an effect on such extractions. The study of mining companies could entail new insights for research regarding companies' ownership structure and firm related outcomes. Their ownership types and relation towards tax avoidance might be different than in other industries. Compared to other firms located in emerging markets which are mostly owned by family or state (Claessens et al., 2000; Cullinan et al., 2012; Douma et al., 2006; Liew 2007), mining companies might entail other type of owners due to their export

sales (Kang & Stulz, 1997). For example, Van Gelder et al. (2016), who investigated the role of tax avoidance by mining firms and illicit financial flows in a research report, mining companies also have owners such as foreign financial companies or holding companies. According to Reyes (2017), who studied public mining companies and shareholder value, another, typical owner of mining companies is the institutional owner. Hence, with the case of the mining sector in Indonesia, this thesis can contribute and add several owners like foreign and institutional owners next to the studied owners such as family and state owners.

This study investigates the effect of the ownership types family, state, domestic corporate and domestic institutional and foreign. Regressions are also run with public ownership as a matter of data completeness. Public Indonesian Mining companies also owned by minority owners and these are added up. They are based on all other owners owning less or equal to 5%. Public ownership is considered as controlling owner if the total amount of ownership equal 5% or more in this study.

The study of Indonesia's mining industry and these different identities of owners might entail new insights into the broad spectrum of tax avoidance and the country's economic development.

Second, most of current literature, which investigated ownership structure's effect on firm characteristics, focused on either China (among others Cen et al., 2017; Chan et al., 2016; Cullinan et al., 2012; Jian et al., 2012; Richard-son et al., 2016) or Anglo-Saxon countries (among others Ang et al., 2000; Krivogorsky 2006; Maury 2006; Kiesewetter & Manthey 2017). This study, on the other hand, explores the relationship between ownership structure and tax avoidance for Southeast Asian companies by taking Indonesia as country of study. Therefore, this thesis extends the findings on tax avoidance and ownership structure.

Third, a majority of the studies that consider ownership structure describe this structure over a short period of time. Since the ownership structure of firms might also change over time, considering several years of observation might entail different findings and or benefit as extra robustness of the study. The benefit of this study is that it covers observations between 2004 and 2018, by this the change of ownership. This approach allows as well to recognize possible trends among those years such as impacts of nationwide regulations. Now, variations between the years are also covered.

The results of this research can provide new aspects and information to improve tax regulations, in particular for emerging markets in order to avoid or mitigate illicit financial flows and tax crimes. Such events not only lead to unfair compensations and inequitable resource distribution but also environmental

issues and poverty. In the case of Indonesia for instance, the communities still benefit less from the mining firm's operations and projects due to lack of state public funding caused by those tax avoidance activities (Saputra & Abdullah, 2015).

To summarize, the contributions of this thesis are:

- With the study of the mining industry, it investigates several types of owners, hence extending research on the relation between ownership structure and tax avoidance.
- Adds to scarce research regarding the ownership structure of Southeast Asian companies.
- Includes many years (2004-2018) and by this explicitly accounting for changes of ownership , including possible trends over the years.

1.3 Thesis Outline

The remainder of this thesis is organized as follows. The next chapter, *Chapter 2*, deals with the literature review and the development of the hypotheses and a short analysis of Indonesia. In this chapter, case examples and definitions are given in order to provide an understanding of the problem and to emphasize the relevance of this study. It includes an elaboration on theory, which explains the motivation of the hypothesized relations between ownership structure and tax avoidance. At the end of the chapter, a concept model is provided to give the reader an overview of the hypotheses. *Chapter 3* reports the research methodology part of this study with a review on methods used by prior theses. Chapter 3 is followed by *Chapter 4*, which covers the method of gathering the data used in this thesis and a description of it. The regression results are provided in chapter 5 followed by the thesis's conclusion (*Chapter 6*) and further research and limitations (*Chapter 7*).

2 LITERATURE REVIEW AND HYPOTHESIS FORMULATION

This chapter provides a literature review on the relationship between ownership structure and tax avoidance, in order to create an understanding of the topic and to support the reasoning of the study's assumption and developed research question (see Chapter 1). First the term tax avoidance is defined by elaborating on other related factors in order provide insights into the topic. Next, a definition of ownership structure is provided, which is followed by the theory used in this study explaining the effect of ownership structure and tax avoidance. This part is supported by empirical evidence, which strengthens the link between the two variables. The chapter finishes with the development of the hypotheses. Furthermore, this chapter provides a short country analysis of Indonesia and information on the mining industry.

2.1 The Spectrum of Tax Avoidance

The tax world is tremendous and not easy to encompass, which is one of the main reasons why even with regulations, events such as tax avoidance still take place. In order for the reader to gain a basic knowledge of the term "tax avoidance", which is the focus in this study, this section covers tax avoidance factors and adds case examples.

2.1.1 Tax Avoidance

Tax avoidance is based on techniques, which are applied to lower the firm's corporate tax obligations. Such practices cause the transfer of value from the state to the firm's shareholders (Desai & Dharmapala, 2009). However, it is not necessary questionable to enact on tax avoidance. Namely, one of the firm's directors main required action points is to minimize taxes and apply aggressive tax avoidance strategies (Christensen & Murphy, 2004). Some of the tax codes even suggest firms to reduce their taxes. This is because tax avoidance can benefit the firm in several ways.

First of all, decreasing tax payments ensure more cash return to the shareholders, increases shareholder value (Bayar et al., 2018; Chan et al., 2016; Sari et al., 2017). Second, tax savings can be used for reinvestments to the firm (Chan et al., 2016) and by this firm value can increase.

Nevertheless, since many corporations do not pay the fair amount of taxes due to tax avoidance techniques, tax avoidance is rather been perceived as immoral (International Tax Review and PWC, 2007). Namely it leads to a reduction in state revenue and by this to the reduction in state funding, investments,

etc. This effect is critical, since state revenue and funding are needed to ensure a stable and healthy economy and contribute to the countries development.

Furthermore, the assumed shareholder value effect caused by tax avoidance techniques can be mitigated due to agency conflicts. Tax avoidance can act as a tool to extract rents, which is only beneficial to specific firm parties, not all shareholders. Either the manager can tunnel the tax savings for personal benefit or controlling shareholders do so and exploit the minor shareholders (Chan et al., 2016). Due to the misuse of power and decision-making rights by this insiders (managers) and controlling shareholders and the immoral application of legal tax avoidance techniques firm value can decrease instead of increase, as was intended at first.

Another negative aspect of tax avoidance is the damage of firm's reputation and image. Tax payments are a firm's social responsibility since those payments belong to the state revenue, which can be used for infrastructure or social programs and security (Huseynov & Klamm, 2012). Also, it is expected that all citizens pay taxes. Corporations are not supposed to be excluded form their tax payment duties. By this, hesistance of the firm to pay taxes creates mistrust towards the firm and harms the firm's existence and reputation. Also some shareholders like outside shareholders who do not benefit by the rent extraction might discount the share prices (Desai & Dharmapala, 2006) and this leads to losses and a decrease in firm value.

Tax Shelters

Tax shelters are vehicles or devices in order to shield one's taxable income from tax obligations (Cordes & Galper, 1985). These are arrangements made between, e.g., the government and the individual to protect some or all income from taxation (Van Dijk et al., 2006). Tax shelters are legal and an example of such activities are real estate investments or retirement plans. In other words, it means legally storing assets with such tactics to mitigate tax liabilities (Kagan, 2019). Hence, the legal approach of using tax shelters is called tax avoidance (Cordes & Galper, 1985)[2]. That is to say that with tax shelters government regulations are applied with self-serving intentions and not with the actual intention of the legislation (Binkmann (1999), as cited by Wilson (2009)).

[2] Kagan, J. (2019, July 03). Tax Shelter. Retrieved from https://www.investopedia.com/terms/t/taxshelter.asp#:~:text=Tax%20shelters%20are%20legal%2C%20and,retirement%20plans%20and%20municipal%20bonds

Nevertheless, tax shelters can also be used to illegally avoid taxes (tax evasion) (Cordes & Galper, 1985; Hope et al., 2013).

Tax Planning

Tax avoidance is part of tax planning. Tax planning can for instance deal with the realisation of income generated from services such as intellectual property, which are based in jurisdictions other than those in which the operations of the firm are actually taking place. Tax planning is influenced by tax policies and the firm's investment choices (Hong & Smart, 2010). In other words, all activities by the firm to gain tax benefits belong to tax planning (Shaipah et al., 2012), which is performed by tax management.

Tax Management

Tax management is typically done by the firm's tax department, which ensures that tax information is provided in the firm's financial statements. It also has the mission to optimize the firm's tax position with tax planning strategies, hence it aims to improve financial positions and performance (International Tax Review & PWC, 2007).

As pointed out earlier, many firms make use of the still unclear rules and regulations and gaps within the tax law to a large extend and use their tax management to exploit such gaps. They behave in ways which are not officially illegal but which are questionable and dubious and shift vast amounts of profits. The real profit margins of the firms are not or only really difficult to track. Available approaches and data to do that and to observe the profit shifting are challenging and differ from another (Fuest et al., 2013). Tax avoidance techniques became especially a common business practice for multinational firms like Enron (see Section 'Tax Havens' below).

Tax Avoidance Strategies

In the remainder of this subsection, some specific tax planning strategies are discussed. Tax planning strategies lead to tax avoidance, hence less taxes paid by the corporation. Illustrative examples are provided, starting with Enron, a company who due to tax avoidance was able to earn about $1.8 billion of profits and at the same time was able to avoid paying $2 billion of federal income taxes over a period of five years. Enron did not only reduce its net profit before tax tremendously by paying its advisors $88

million in fees to prevail paying $2 billion taxes. Like many other multinational companies, it used tax havens to decrease or even diminish tax payments. [3][4]

Tunnelling

Tunnelling covers the transfer of resources, which rather benefit the controlling shareholders instead of the minority shareholders. Such transfers are for instance related party transactions, the sale of assets or products to controlling shareholders or managers or also group firms cheaper than the intended market price. Also loans with lower rates belong to such transfers (Chan et al. 2016; Sari et al. 2017).

With such methods earnings are manipulated and profits can be diverted away from other shareholders. On the one hand, such related party transactions decrease the taxable income for the one firm. On the other hand, the manipulated earnings can be used to meet requirements such as issuing an IPO or avoid delisting for a group firm e.g. if such transactions increase their sales, hence earnings (Jian & Wong, 2003).

Tax Havens

One of common strategies to avoid taxes is to set up divisions of the firm's operations in a tax haven. These are locations of whose jurisdictions require low or no taxes at all, making it lucrative to set up divisions there and to shift profits. Most of such low tax locations are based in Europe, the Caribbean, Africa, the Pacific and Middle East (Bennedsen & Zeume, 2015). According to Bennedsen and Zeume (2015) the tax avoiders set up divisions, trademarks, or patents in those tax havens, charging the operational costs in their higher-taxed countries for those divisions, and thereby decreasing their revenue created in the higher-taxed countries. This leads to less tax payments since they lock their money in the tax havens (Hanlon et al., 2015).

In Enron's case, the company had about 692 of its 881 offshore subsidiaries set in the Cayman Islands. This usage of tax havens enabled the company to shift its profits from higher tax jurisdictions to lower ones. Whereas Enron should have paid large amount of taxes on their pre-tax revenue of $1.8 billion

[3] Johnston, B., D. (2003). Tax Shelters Helped Enron Fabricate Profits, Senate Is Told. The New York Times. Retrieved from https://www.nytimes.com/2003/02/13/business/tax-shelters-helped-enron-fabricate-profits-senate-is-told.html

[4] Johnston, B., D. (2002). Enron's collapse: The Havens; Enron Avoided Income Taxes In 4 of 5 Years. The New York Times. Retrieved from https://www.nytimes.com/2002/01/17/business/enron-s-collapse-the-havens-enron-avoided-income-taxes-in-4-of-5-years.html#:~:text=Enron%20paid%20no%20income%20taxes,among%20businesses%20to%20avoid%20taxes.

they generated in 5 years, they instead even received tax rebates (*see Table. 1 below for an overview of 1996-2000 tax payments and rebates*).

Table 1. Less than Zero: Corporate Income Tax Payments by Enron, 1996 to 2000[5]

$-millions	2000	1999	1998	1997	1996	96-00
U.S. profits before federal income taxes	$ 618	$ 351	$ 189	$ 87	$ 540	**$ 1,785**
Tax at 35% corporate rate would be:	$ 216	$ 123	$ 66	$ 30	$ 189	**$ 625**
Less tax benefits from stock options	–390	–134	–43	–12	–19	**–597**
Less tax savings from other loopholes, etc.	–104	–94	–36	–1	–173	**–409**
Federal income taxes paid (+) or rebated (–)	**$ –278**	**$ –105**	**$ –13**	**$ 17**	**$ –3**	**$ –381**

Google and Starbucks are also popular examples of companies that use tax avoidance tactics such as tax havens to account less profit and by this pay less corporate taxes. Google, for instance, applied the so-called 'Dutch Sandwich' by choosing the Netherlands as a tax haven but also implemented the Double Irish Method (Fuest et al., 2013).

Double Irish and Dutch Sandwich

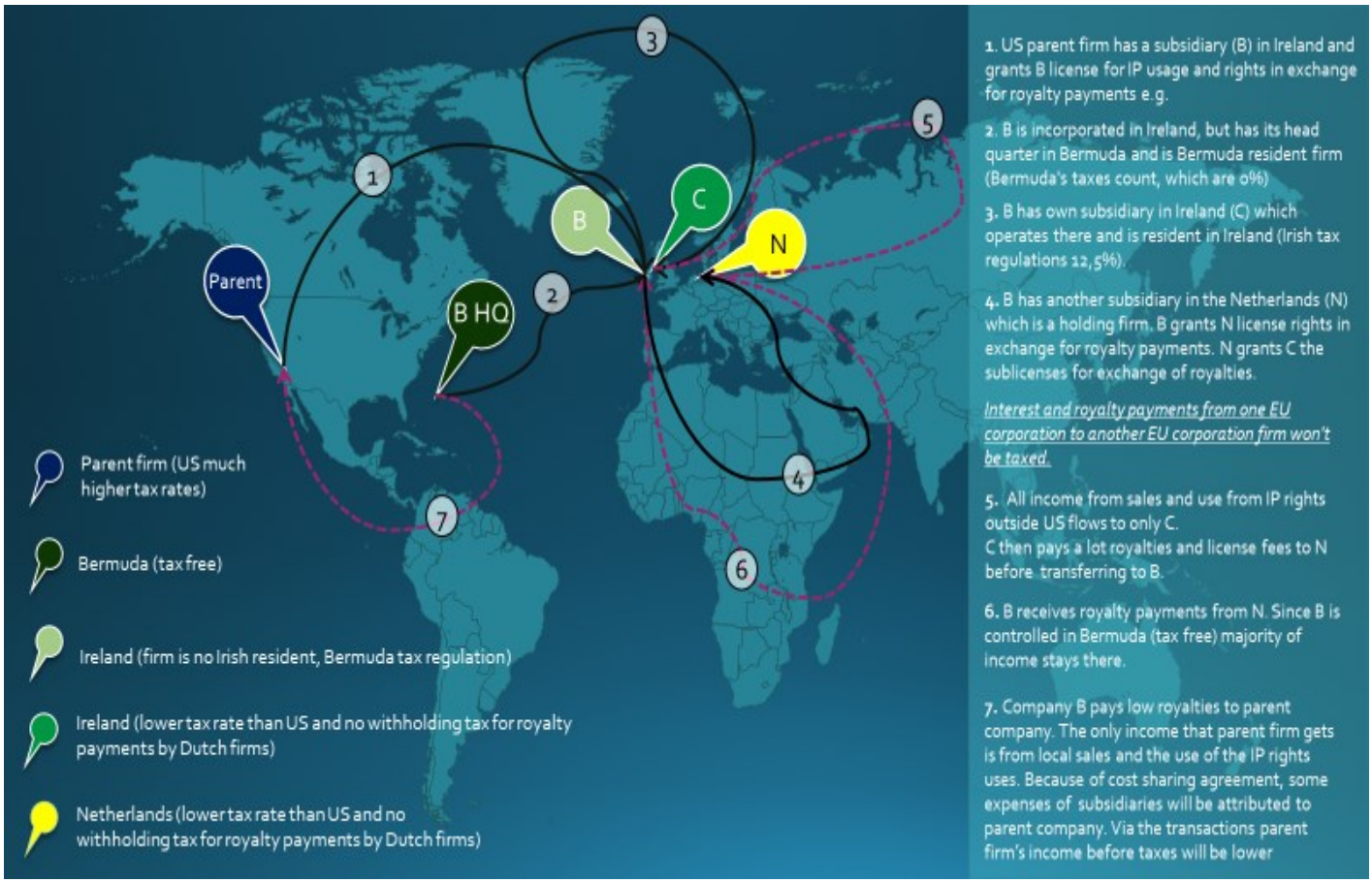
The Double Irish and Dutch Sandwich are illustrated in the self-explanatory Figure 2. Such tactics lead to less revenue left for the countries' governments to invest in for instance private sector developments and employment (Curtis & Consultant, 2011). Furthermore, investments are missing for less-developed districts of the country. This negative effect mainly applies to the host countries in which the firms operate.

There are a couple of reasons why such tax havens accept companies like Google and allow them to use their jurisdictions. The countries which provide less or zero taxes and attract the tax avoiding firms (tax havens) in fact benefit from the corporations running divisions there. Netherlands for instance does not tax dividends, interest and royalties from countries such as the US or only tax them with small rates (Van Dijk et al., 2006). But such havens benefit from more employment possibilities and income. Such income is created by the firm's registration and license fees to banks, property taxes, etc. Hence, the tax havens ask low tax rates but they can benefit by the additional tax payments by the large corporations and their employment (Van Dijk et al., 2006)[6].

[5] Citizens for Tax Justice (2002). Less than Zero: Enron's Corporate Income Tax Payments, 1996-2000. Retrieved from https://www.ctj.org/less-than-zero-enrons-corporate-income-tax-payments-1996-2000

[6] Tax Fitness (2018). Benefits for Tax Haven Countries. Retrieved from https://taxfitness.com.au/Tax-Havens/benefits-tax-haven-countries

Figure 2. The Double Irish and the Dutch Sandwich (created based on information given by Thorne, 2013; Fuest et al., 2013; European Comission[7], 2019)



Tactics like the Dutch Sandwich also seem to exist among mining firms. According to Van Gelder et al. (2016), mining firms in developing countries implement tax avoidance strategies as well. In the case of mining firms in South Africa in 2017, 21 mining firms made use of such tax havens leading to less public investments for the government[8]. Such tactics, and additionally the controversial effect of mining firms on the environment, cause mistrust towards the state, extractive companies, lack of participation, complication and resistance regarding the mining companies.

Indonesia belongs to the countries using the Netherlands as offshore country (Van Gelder et al., 2016). This came to light with the study of Van Gelder et al. (2016), who used 28 indicators for tax

[7] European Commission (2019). Taxation of cross-border interest and royalty payments in the European Union. Retrieved 01 April ,2020 from https://ec.europa.eu/taxation_customs/business/company-tax/taxation-crossborder-interest-royalty-payments-eu-union_en
[8] London Mining Network (2017). South African Catholic bishops ask mining corporations to explain why they use tax havens. Retrieved 01 April, 2020 from https://londonminingnetwork.org/2017/11/south-african-catholic-bishops-ask-mining-corporations-to-explain-why-they-use-tax-havens/

avoidance behaviour investigating 128 mining firms of 5 developing countries including Indonesia. Their exploratory study focused on Dutch financing and holding firms as owners of the mining firms and 34% of the 128 firms were directly or indirectly controlled or financed by those Dutch companies. The parent company (also called ultimate parent company) receives dividends by the holding firm of a business segment and this firm receives dividends from the mining firm.

Most of the mining firms were not locally owned and were subsidiaries of foreign parent firms located in a third country. Nearly all mining firms have a corporate structure based on three types of firms, the Dutch firm, the mining firm and a parent company, being the Dutch firm mostly responsible for finance, licensing and management. It seems that those parent firms indeed used techniques such as the Dutch sandwich.

According to Van Gelder et al. (2016), indicators belonging to the firm's financial statements, tax arrangements and tax returns and miscellaneous were the most ones occurred within those mining firms. Indicators within the financial statement are for instance payments of royalties for the use of patents in lower tax rate. Indicators related to tax arrangements and tax returns are for instance differences between reported and taxed income and indicators which belong to miscellaneous are for instance hiding beneficial owners.

2.2 Ownership Structure of Firms

The ownership structure of a firm is typically based on the division of shares among the shareholders (Claessens & Yurtoglu, 2013). Some shares provide control rights (also known as voting rights), while others might give cash-flow rights. Control rights provide more power towards decision making of the business while cash flow rights give the rights to more cash return and more direct equity stake of the firm (Jin & Park, 2015). Hence, different owners of the firm might have different types of rights.

A firm's ownership structure is furthermore based on ownership concentration and owners' identity (Saleh et al., 2017). Ownership concentration is determined by the number of shareholders and their distribution of shares (Horobet et al., 2019), dividing them typically into the group of majority shareholder and minority shareholder (Saleh et al., 2017). According to Masripah et al. (2015) and Utama et al. (2017), Indonesian firms have mostly concentrated ownership structures, meaning most of the shares of the company are owned by only one or few shareholders (Cullinan et al., 2012).

There are also different identities controlling the firm. They influence the strategy of the firm and decision makings according to their character (Claessens & Yurtoglu 2013; Douma et al., 2006; Saleh et

al., 2017; Thomsen & Pedersen 2000). According to Utama et al. (2017) in the case of Indonesia, most of the ultimate owners of Indonesian public companies are Indonesians (domestic corporations and foreign ones which are owned by Indonesians) followed by the state as ultimate owner.

2.2.1 Theory on Ownership Structure - Tax Avoidance Relationship

This study applies the agency theory to account for the assumed effects of ownership structure on tax avoidance. This theory provides a framework linking the human behaviour 'self-interest' to firm's decision and business outcomes. As pointed out earlier, tax avoidance and other firm decisions do not happen without the knowledge of decision makers such as managers or controlling shareholder and the advantages do not benefit all parties. This why understanding the agency theory can help to explain the variations in tax avoidance and to find possible determinants of it. Hence, this study uses its framework to formulate the thesis's hypotheses.

The next section provides a small introduction to the agency theory, which is followed by an overview of prior research studying ownership structure and tax avoidance.

Agency Theory

The agency theory deals with the spectrum of conflict between managers and owners and between other shareholders of a firm. This theory states that managers and owners intend to make decisions benefitting their own interest instead that of the overall firm and all its shareholders (Douma et al., 2006; Platt & Platt, 2012) whereas their responsibility and duty should rather be to ensure shareholders wealth (Kabir et al., 2013).

Managers can cause agency conflicts by going behind the back of the firm's shareholders since the manager has the capability to hide insider information, leading to an information asymmetry (Setiawan et al., 2016). A tactic to hinder managers by ignoring shareholders needs is to out-seat the manager with the power of the biggest shareholders (controlling) or by hostile takeovers (Douma et al., 2006).

The conflict between the manager and principals is type-I of the agency conflict. Also, other conflicts can arise, namely between the principals themselves leading to type-II of the agency conflict (Chan et al., 2016; Douma et al., 2006; Jian and Wong 2003; Jong & Ho, 2018; La Porta et al., 1999). argue that the controlling shareholders could use the firm's resources as they wish or perform related party transactions. By this they neglect other shareholders. Also, while the one shareholder would like to

monitor the manager and prefers good corporate governance, the other shareholder hesitates to spend resources on monitoring (Douma et al., 2006).

Agency conflicts seem to occur most notably in concentrated ownership environments (Claessens & Yurtoglu, 2013). Hence, the ownership structure of the firm has an effect on the agency problem. Here the board of directors can play a significant role since it has the power to decide on monitoring incentives and to implement a better corporate governance, by this mitigating agency conflicts (Minnick & Noga, 2010).

As the agency theory states, different shareholders and the divergence between their rights within the firm can cause agency conflicts. As mentioned before, tax avoidance might not per se benefit all shareholders of the firm. In fact, decisions regarding tax avoidance might be directed because of the different interests of individual owners.

One of the few studies linking ownership structure and tax avoidance is Khan et al. (2017). Their results showed that concentrated ownership leads to higher tax avoidance. Also other studies investigated the role of ownership and tax avoidance by resting upon the agency conflict. The traditional view of tax avoidance states that decreasing tax payments increases shareholder value, by reinvesting and returning the saved taxes (Bayar et al., 2018; Chan et al., 2016; Sari et al., 2017). Nonetheless, when considering the emerging agency view, tax avoidance techniques can be exploited by parties such as managers to extract wealth from shareholders and the firm, especially in countries with weak corporate governance (Chan et al., 2016; Desai & Dharmapala, 2009). The non-tax costs such as penalties and reputational damage due to tax avoidance would then reverse value enhancing effect of it (Chan et al., 2016; Desai & Dharmapala, 2009; Tang, 2019).

Thus, the divergence between the dominant and small shareholders can create agency problems due to exploitation (e.g. rent extractions) and that could play a role on the tax behaviour of the shareholders. Consider, for instance, a firm controlled by family members. In the study of Chen et al. (2010) those firms tend to avoid taxes less than non-family owned firms (Chen et al., 2010). Chen et al. (2010) argue that the impact on tax avoidance behaviour is indeed affected by the type of owners. For example, they find that the presence of other owners than family ones (managers/ institutions), can again mitigate or even strengthen the effect on tax avoidance, indicating that ownership identity influences the decision on tax avoidance.

Ownership plays a relevant role especially in developing countries' mineral wealth and power. According to Luong and Weinthal (as cited in Bayulgen, 2012) mineral-rich states are not cursed by their wealth but rather by the structure of ownership.

Above mentioned prior studies and findings provide an indication that tax avoidance might be related to the firm's ownership structure, but more research should validate this hypothesis. This study takes the principal to principal perspective (type-II agency conflict) during the research.

Previous Research

Literature regarding ownership structure and tax avoidance as well as studies covering the impact of different type of owners regarding ownership structure are rather limited. Most studies focusing on the role of ownership structure use either one or two type of owners such as family, state or institutions (for instance Chan et al., 2013; Chen et al., 2010; Fernández-Rodríguez et al., 2019; Gaaya et al., 2017; Khan et al., 2017; Lanis & Richardson 2011; Masripah et al., 2016; McGuire et al., 2014; Richardson et al., 2016).

Additionally, previous studies did rarely distinguish between domestic type of owners and foreign ones. This study aims at decreasing the gap in findings and studies related to the ownership structure and tax avoidance by including various type of owners such as foreign ones.

Furthermore, during research it was notable that most research on ownership structure and/ or tax avoidance cover the US market (among others Ang et al., 2000; Badertscher et al., 201); Bayar et al., 2018; Boone & White 2015; Chen et al., 2010; (Demsetz & Kenneth 1985; Huseynov & Klamm 2012) and European market (among others Fernández-Rodríguez et al., 2019; García et al., 2008; Kiesewetter & Manthey 2017; Krivogorsky 2006; Mafrolla 2019; Maury 2006; Sacristán-Navarro et al., 2011; Shaipah et al., 2012). Findings on emerging markets other than China is scarce. China belongs next to the U.S. to the market which is studied the most in research regarding ownership structure and/ or tax avoidance (among others Cen et al., 2017; Chan et al., 2013; Chan et al., 2016; Cullinan et al., 2012; Jian et al., 2012; Richardson et al., 2016). Only a few covered other developing countries. One of the few ones elaborating on Indonesia and especially ownership structure and tax avoidance are Handayani and Ibrani (2019), Masripah et al. (2016) and Sudibyo and Jianfu (2016). They studied either a few types of owners namely family, controlling holders in general or state and address that it is crucial to make changes within the firm's corporate governance, hence behaviours of firm parties need to be controlled to avoid self-interest based decisions, which harm other shareholders.

Of the above mentioned prior studies, only those which focus on the relationship between ownership structure and tax avoidance, are provided in Table 2. Table 2 gives an overview of the countries they studied as well as the authors' results on the direction of their examined relationships. As can be seen, studies concentrating on Indonesia are limited.

Table 2. Prior studies covering ownership structure and tax avoidance

US		Europe		CHINA		INDONESIA		GLOBALLY	
	Findings		**Findings**		**Findings**		**Findings**		**Findings**
Badertscher et al. (2013)	Management ownership leads to less tax avoidance. Assumption: Due to risk averse character	*Fernández-Rodríguez et al. (2019)*	State ownership leads to tax avoidance. Assumption: tax incentives offered by Spanish regulations lead to lower tax burden	*Chan et al. (2013)*	State ownership leads to less tax avoidance compared to non-state ownership. Assumption: managers of state-owned firms rather meet political goals to ensure state revenue Non-state ownership with high board shareholdings and with CEO as chairman lead to more tax avoidance. Assumption: double role of CEO might mitigate governance and monitoring role of board; more difficult for board to hinder tax proposals Local state ownership in less developed locations lead to more tax avoidance. Assumption: local government cannot benefit fully from tax payments	*Masripah et al. (2016)*	Family ownership did not show any significant influence on tax avoidance	*Bayar et al. (2018)*	Institutional ownership in firms with strong governance leads to tax avoidance. Assumption: Well governed firms manage taxes more efficiently
Chen et al. (2010)	Family owners lead to less tax avoidance due to non-tax cost of, price discounts, potential penalty and reputation damage	*Mafrolla (2019)*	State ownership leads to higher tax avoidance. Assumption: due to tax planning policies for state-owned firms and state-owned managers pursue political goals, attempt to minimize costs (though most of TA is based on local governments)	*Richardson et al. (2016)*	Family ownership leads to less tax avoidance. Assumption: due to non-tax cost of price discounts, potential penalty and reputation damage	*Sudibyo & Jianfu (2016)*	State ownership leads to less tax avoidance, though political connection of firms lead to tax avoidance		
Huseynov and Klamm (2012)	Institutional ownership leads to tax avoidance. Might be due to monitoring the manager and require him to increase shareholder wealth by also decreasing costs such as tax payments			*Jian et al (2012)*	State ownership leads to less tax avoidance than non-state ownership. Assumption: managers of state-owned firms rather satisfy state with tax payments				

2.3 Institutional Environment

2.3.1 Country

Indonesia is a former colony of the Netherlands and achieved independence in 1945. Now the country has a democratic government with a presidential system and applies the civil law (Tran, 2017). With about 34 provinces[9] and more than 17,000 islands, Indonesia is the fourth largest country concerning population[10]. The country has more than 300 ethnic groups[11] and about 87% of its population are Muslims making Indonesia the largest Muslim-majority country[12]. Other religions followed are among others Buddhism and Catholicism (Tran, 2017). The population in Indonesia is divided into 2 major groups. The one being the western region with mostly Malaysian ethnicity and the east region with a majority of Papuan ethnicity[13]. Being the second largest exporter of natural gas, the country is also a net importer of oil due to the increased domestic demand[14]. Agriculture products of Indonesia include rice, tea, coffee, rubber and spices[15].

2.3.2 Economy

In the last couple of years, Indonesia became Southeast Asia's largest economy. It is especially rich in resources such as copper, gold and coal[1617]. In 2019, the United States took Indonesia off the list of developing countries[1819]. Today, Indonesia is one of the 10 countries with the largest

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[9]OECD (2016, May 12 2020). Indonesia: Unitary Country. Retrieved from https://www.oecd.org/regional/regional-policy/profile-Indonesia.pdf

[10] Mohamad, S. G., McDivitt F. J., Adam, W. A., Legge, D. J., Leinbach, R. T., Wolters, W. O. (2020). Indonesia. Britannica.com Retrieved 13 May, 2020 from https://www.britannica.com/place/Indonesia

[11] The Worldbank (2020, April 02). The World Bank In Indonesia: Having maintained political stability, Indonesia is one of East Asia Pacific's most vibrant democracies, emerging as a confident mid-dle-income country. Retrieved from https://www.worldbank.org/en/country/indonesia/overview

[12] World Population Review (2020, May 14). Muslim Population By Country 2020. Retrieved from https://worldpopulationreview.com/countries/muslim-population-by-country/

[13] The Embassy of Indonesia Prague (2020, May 14). The Government of The Republic of Indonesia. Retrieved from http://www.indonesia.cz/the-government-of-the-republic-of-indonesia

[14] Extractive Industries Transparency Initiative (2020 May 2014). Indonesia. Retrieved https://eiti.org/es/implementing_country/53

[15] The Embassy of Indonesia Prague (2020, May 14). The Government of The Republic of Indonesia. Retrieved from http://www.indonesia.cz/the-government-of-the-republic-of-indonesia

[16] Developmentaid (2019). Indonesia launches an International Development Aid Fund. A look back at Indonesia's aid history. Retrieved 15 March, 2020 from https://www.developmentaid.org/#!/news-stream/post/55554/indonesia-launches-an-international-development-aid-fund-a-look-back-at-indonesias-aid-history

[17] The Worldbank (2019, May 14 2020). Indonesia Maintains Steady Economic Growth in 2019. Retrieved from https://www.worldbank.org/en/news/press-release/2019/07/01/indonesia-maintains-steady-economic-growth-in-2019

[18] The Insider Stories (2020, April 02). US Removes Indonesia from Developing Countries Lists. Retrieved from https://theinsiderstories.com/us-removes-indonesia-from-developing-countries-lists

[19] The Jakarta Post (2020, April 02). Indonesia still deserves special treatment in global trade: Economists. Retrieved from https://www.thejakartapost.com/news/2020/03/02/indonesia-still-deserves-special-treatment-in-global-trade-economists.html

purchasing power parity and a G-20 member with a 20-year development plan (2005-2025) based on different priorities for the economy such as social assistance programs and infrastructure development[20].

Over the past 3,5 years, Indonesia's economy has grown consistently with a GDP quarterly growth between 4,9 and 5,3 %. New infrastructure projects and reconstruction efforts in Lombok and Palu, where natural catastrophes were experienced, enable also more government investing. Indonesian labour markets are strong and the country has a strong consumer spending boom and low inflation[21].

2.3.3 Poverty

Whereas Indonesia's development stage improved substantially, many aspects are still controversial. The change in title switching from developing country to developed one[22][23], should not give the impression that Indonesia overcame much or all of its problems, which are distinctive in developing countries. According to The Worldbank (2020), about 25,1 of the 264 million Indonesians are considered to live below the poverty line and there are still many poor local communities. Despite efforts to improve public services, particularly in health, the quality in life is unbalanced by middle-income standards[24].

2.3.4 Environment

Critical is also Indonesia's impact on the environment. The country experiences peatlands degradation and slash-and-burn farming. They are the biggest contributors towards Indonesia's

[20] The Worldbank (2020, April 02). The World Bank In Indonesia: Having maintained political stability, Indonesia is one of East Asia Pacific's most vibrant democracies, emerging as a confident mid-dle-income country. Retrieved from https://www.worldbank.org/en/country/indonesia/overview

[21] The Worldbank (2019, May 14 2020). Indonesia Maintains Steady Economic Growth in 2019. Retrieved from https://www.worldbank.org/en/news/press-release/2019/07/01/indonesia-maintains-steady-economic-growth-in-2019

[22] The Insider Stories (2020, April 02). US Removes Indonesia from Developing Countries Lists. Retrieved from https://theinsiderstories.com/us-removes-indonesia-from-developing-countries-lists

[23] The Jakarta Post (2020, April 02). Indonesia still deserves special treatment in global trade: Economists. Retrieved from https://www.thejakartapost.com/news/2020/03/02/indonesia-still-deserves-special-treatment-in-global-trade-economists.html

[24] The Worldbank (2020, April 02). The World Bank In Indonesia: Having maintained political stability, Indonesia is one of East Asia Pacific's most vibrant democracies, emerging as a confident mid-dle-income country. Retrieved from https://www.worldbank.org/en/country/indonesia/overview

large carbon dioxide emissions, creating a carbon bomb according to Greenpeace[25] [26]. Consequently, Indonesia belongs to the fifth largest greenhouse gas emitter world wide[27] (The Jakarta Post, 2019). Moreover, residents and animals suffer from water pollution from industrial wastes, sewage, air pollution in urban areas, smoke and haze from the forest fires as reported by the Embassy of the Republic of Indonesia in The Hague[28].

2.3.5 Corruption

Indonesia is ranked 85 out of 180 countries in the corruption perception index in 2019, which means a high perceived level of public sector corruption[29]. The main drivers for the high corruption level seem to be legal uncertainties, complex regulatory frameworks and strong domestic vested interests and decentralized decision-making processes. They enable for example bribes by companies in the processes of registering businesses, filing tax reports and receiving permits and licenses (Merkle, 2018). Decentralization in Indonesia seems to not have reduced the corruption. There might be greater responsibility by the cities/villages but transparency, strong institutions and accountability are missing (Merkle, 2018). Also, central authority to monitor and issues natural resource development licenses is missing. This for instance empowers officials to exchange land rights, which financially benefit their campaigns[30].

[25] United Nations Environment Programme (n.d.). Working as one: how Indonesia came together for its peatlands and forests. Retrieved 20 May, 2020 from https://www.unenvironment.org/news-and-stories/story/working-one-how-indonesia-came-together-its-peatlands-and-forests

[26] The Carbon Brief (2019). The Carbon Brief Profile: Indonesia. Retrieved 20 May, 2020 from https://www.carbonbrief.org/the-carbon-brief-profile-indonesia

[27] The Jakarta Post (2019, May 20 2020). Indonesia must address climate change in more concrete terms: UN. Retrieved from https://www.thejakartapost.com/news/2019/06/21/indonesia-must-address-climate-change-in-more-concrete-terms-un.html

[28] The Embassy of the Republic of Indonesia in the Hague (n.d.). Indonesia. Retrieved 20 May, 2020 from https://www.en.indonesia.nl/indonesia/profile/geography

[29] Transparency International (2020). Transparency International Indonesia. Transparency International: The global coalition against corruption. Retrieved 15 May, 2020 from https://www.transparency.org/en/countries/indonesia

[30] Mathiesen, K. (2016). Greenpeace reveals Indonesia's forests at risk as multiple companies claim rights to same land. The Guardian. Retrieved 08 May 2020. From https://www.theguardian.com/sustainable-business/2016/apr/02/greenpeace-palm-oil-logging-indonesia-overlapping-land-claims-greenpeace-forest-fires

2.3.6 Investments and Tax Regulation

Asian conglomerates are among the top foreign investors, but American and European companies are more and more entering the Indonesian market too[31]. However, Indonesia is still ranked 73 of 190 economies regarding the ease of doing business[32].

Indonesia's audit board evaluates the management of state finances and monitors transactions from state-owned firms (SOE), government, local governments and other state finance involved parties (Merkle, 2018). Senior government officials and other bodies working in specific agencies are required to report all assets held by them and or families before, during and after taking office to the KPK (Corruption eradication commission). Unfortunately, the KPK has limited resources and by this cannot entirely and fully detect wrongful behaviours (Merkle, 2018).

The current tax rate for Indonesia's corporate income tax is 25%. Resident corporate payers with earning gross revenues up to Rp 50 billion receive 50% tax reduction. If they manage to not exceed a gross revenue of Rp 4.8 billion in a tax year, they get a final income tax of only 0.5%. For non-resident corporations, there is a branch profit tax of 20% (Deloitte, 2019). Thus, the foreign firms are taxed additionally, if they to not reinvest their after tax gross revenue in Indonesia. The underlying assumption is that they otherwise probably channel the revenue back to shareholders as dividends or to their own country[33].

Law in Indonesia states that every company wanting a tax refund, needs to undergo a 1 year long tax audit but there is no threshold; $100 and $1000000 tax refund will both be audited then. In Indonesia, the estimated tax payment for current year is based on last year taxable income. So, if your current years income is less than last year, you would have a higher estimated tax payment than you should have paid.

One of the group of firms which has a high chance of being audited, are Indonesian firms who are doing business with partners in lower tax places like havens. Audits in Indonesia do not go through records, they go and ask for a good explanation about the firm's supply chain. After two days, they are going to start to look at the numbers to see if the story with the supply chain explanation makes sense with the provided numbers. They look at all type of taxes like VAT

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[31] Cochrane, J. (2013). Multinationals Hasten to Invest in Indonesia. The New York Times. Retrieved 13 May, 2020 from https://www.nytimes.com/2013/04/24/business/global/indonesia-sees-foreign-investment-surge.html

[32] The Worldbank (2020, May 15). Ease of doing business index. Retrieved from https://data.worldbank.org/indicator/IC.BUS.EASE.XQ

[33] Klasing, D (2019). What is the Branch Profits Tax? Retrieved 15 May, 2020 from https://klasing-associates.com/question/branch-profits-tax/

employment tax[34]. This approach could raise the probability of corruption, since firm records are not monitored well and looked at in detail.

Regarding individual taxes Indonesian tax residents pay taxes on their worldwide income, thus income derived from Indonesia as well as abroad, while under certain circumstances they can gain foreign tax credits on foreign income due to tax treaty between the countries for instance. The personal tax rate is 5% for income up to Rp 50 million, 15% for Rp 50 million-Rp 250 million, 25% for Rp 250 million-Rp 500 million and 30% for more than Rp 500 million. Non-residents only have to pay 20% of personal income taxes on income derived from Indonesia. Also here the tax rate depends on circumstances such as treaties between the residence they are taxed in and Indonesia (Deloitte, 2019). Indonesia has no local tax rates for individual income[35]

2.3.7 Mining Industry

For decades, energy resources have been crucial to Indonesia's economy. The country is especially known for its coal generation, and belongs to one of the top coal exporters globally[36].

The mining industry belongs to one of the sectors mainly leading to Indonesia's economic growth. It contributes to a large extend to Indonesia's GDP, state revenue, exports, employment and especially the development of many remote areas (Institute Indonesian Mining, 2018). The country plans to further commit to coal-fired electricity generation (Winzenried et al., 2018). In 2017, the mining sector was not only the second largest contributor to national exports, but also contributed tremendously to the state revenue.

Nevertheless in 2018 the Worldbank reported that mining does not belong to the country's largest contributors towards exports, GDP, state revenue and employment like it did in the past. The reason is that other non-mining sectors grow. Still, mining is seen as a strategic national importance and especially of relevance to specific areas like Kalimantan and Papua. The mining industry employs annually up to 1,6 million jobs and by this enhances job creation. It plays a relevant part in the regional economies (Institute Indonesian Mining, 2018).

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[34] Siregar, N. [YouTube]. (2014, August 13). Tax Audits in Indonesia. Interview by Deloitte [Video file]. Retrieved from https://www.youtube.com/watch?v=TWRLarkA_mQ

[35] PWC (2020). Indonesia: Individual - Taxes on personal income. Retrieved 05 November, 2020 from https://taxsummaries.pwc.com/indonesia/individual/taxes-on-personal-income

[36] Indonesia Investments (2018). Coal. Retrieved 16 May, 2020 from https://www.indonesia-investments.com/business/commodities/coal/item236

With the support of the Worldbank, the government seeks to improve the mining sector, its policies, mitigate challenges and to make informed policy choices. One of the key areas for improvement in the mining sector seems to be the management of local impacts of mining. This would be done by including local communities, public disclosures, monitoring of environmental and societal impacts etc.

Still, much improvement is needed towards the political environment and investment conditions (corruption, expropriation risk, political instability, mining an tax policies) (Institute Indonesian Mining, 2018).

Investments in mining industry

Whereas Indonesia's wealth in natural resources attracts foreign investments, foreign investors are rather discouraged to invest due to government regulations and high degree of corruption in the country[37]. Regarding investments in mining, in 2019 Indonesia ranked among the 13 least favoured jurisdictions to invest in due to its mining policies and by this shows high barriers to invest[38].

Indonesian mining SOEs need to comply with the International Financial Reporting Standards IFS and publish the annual financial audits. Whereas in the previous mining law, 100% foreign owned firms might have had to face divestment regulations later on, the new law replaced prior contracts with the mining business licenses IPU and special mining business license IUPK. Those can be granted to Indonesian individuals, corporations or business entities (Institute Indonesian Mining, 2018).

Since 2012, mining firms had to develop the refining and processing facilities in Indonesia. Also, unprocessed ore exports were banned in 2014. With the licenses, some low-grade minerals can be exported for up to 5 years. The agreement ends in 2022. Critical for investments here is the obligation of paying export duties and the minimum requirements for processing and refining domestically, creating legal uncertainties in the mining business (Institute Indonesian Mining, 2018).

Surprisingly, regulations regarding oversight of the administrations and tax authorities is limited. Government officials, who oversee the mining sector are not required to provide

37 U.S. Department of State (2019). Investment Climate Statements: Indonesia. Report. Retrieved 20 May, 2020 from https://www.state.gov/reports/2019-investment-climate-statements/indonesia/

38 Stedman, A., Yunis, J. & Aliakbari, E. (2019). Survey of Mining Companies 2019. Fraser Institute Annual. Retrieved 15 May, 2020 from https://www.fraserinstitute.org/sites/default/files/annual-survey-of-mining-companies-2019.pdf

information on their financial interests in the activities and projects. Also, public investment projects are not really checked regarding their costs and benefits nor do they need to undergo independent audits (Institute Indonesian Mining, 2018). The lack of binding provisions and lack of transparency regarding government officials and their power, cause mistrust towards the fair monetary channels of the mining sectors and actual contribution to the economy and state revenue. These factors support the impression that there seems to be an unbalance between state revenue and mining tax obligations, leading to illicit financial flows.

2.3.8 Illicit Financial Flows

According to the global coalition of civil society organizations (COS) which includes 40 countries, it is a fact that there is an imbalance between the revenues of the mineral resources (state revenues) and economic development in Indonesia and the reason lies in illicit financial flows and tax crimes in the mining sector (Saputra & Abdullah, 2015). Flowler (2017) argues that the reason for the imbalance between Indonesia's state revenue, despite its rich resources, seems to a bigger extend lie in the tax avoidance of the mining firms in Indonesia, which leads to less funding available for public spending[39]. In 2016, Indonesia's tax revenue realization only increased by 4.2% even though the mining sector seems to have grown tremendously in the last couple of years. This implies that Indonesia's tax revenue collections do not grow accordingly[40].

These so-called tax gaps do not only affect Indonesia. Globally, tax avoidance causes about $600 billion of revenue losses worldwide of which $200 billion losses stem from developing countries.

In Consequence, countries such as Indonesia suffer from (tax) revenue losses and a poor economy (which is by a large extend caused by lack of tax payments by corporations). Controversially, they receive official development assistance (ODA), which is financial aid from

[39] Fowler, N. (2017). Dear mining companies, why do you use tax havens? Tax Justice Network. Retrieved 01 July, 2019. From https://www.taxjustice.net/2017/12/04/dear-mining-companies-use-tax-havens

[40] Indonesia Investments (2017). Tax Buoyancy Indonesia: GDP Growth & Tax Revenue are Asynchronous. Retrieved 22 June, 2019. From https://www.indonesia-investments.com/news/todays-headlines/tax-buoyancy-indonesia-gdp-growth-tax-revenue-are-asynchronous/item7613

other countries (OECD, 2020)[41][42]. Governments are one of the providers, hence taxes provided by individual tax payers are used for such an aid. This increases the mistrust towards the state.

2.4 Hypotheses Development

As addressed earlier, the agency perspective on tax avoidance indicates that ownership structure affects the firm's decision making and might by this influence their likelihood of saving taxes. This chapter covers the thesis's hypotheses regarding the type of owners and the firm's tax avoidance in order to provide and stress the reasoning of the thesis's assumption and developed research question. To note here is that no hypothesis is provided for public ownership. The inclusion of public ownership is merely for the sake of data completeness (explanation in the variable measurements and definitions section).

2.4.1 Family Ownership

According to Claessens and Yurtoglu (2013) and Handayani and Ibrani (2019), families are the largest direct shareholders and by this the controlling ones in Indonesia. They are typically involved in the management of the firms too. La Porta et al. (1999) even found that in 69% of the family controlled firms, the family also manages the firm. By this they are insider owners (Claessens & Yurtoglu, 2013; Masripah et al., 2016). Considering the agency theory here, one would assume type 1 and 2 of agency conflict, since the controlling shareholder (the family) could expropriate minority shareholders, whereas as managers they might make selfish business decisions such as extract rent from the tax savings.

Liew (2007) found that family owners tend to avoid taxes, which is supported by Gaaya, Lakhal and Lakhal (2017) who argue that they do so by extracting rents from tax saving positions. The positive relationship between family ownership leading and tax avoidance in research might be explained by the fact that the family in this case is probably also the entrepreneur. As an entrepreneur, it wants to maintain control, especially when investor protection is poor. By this the family can act selfish by ensuring private benefits from take overs, for instance (Bebchuk (1999)

[41] OECD. (2020). DAC List of ODA Recipients. Retrieved 15 November, 2020. From https://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/DAC_List_ODA_Recipients2018to2020_flows_En.pdf
[42] OECD. (2020). Official development assistance – definition and coverage. Retrieved 15 November, 2020. From https://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/officialdevelopmentassistancedefinitionandcoverage.htm

as cited by La Porta et al. (2007); La Porta et al., 1999). Also Annuar et al. (2014) found in their study of Malaysian firms that family ownership has a positive effect on tax avoidance. They argue that this effect is related to the concentrated ownership environment in Malaysia. As their shareholders are based on few major ones (of which the family would belong to), their reputation would not be affected as much by e.g. share discounts from minority shareholders.

In contrast, Chen et al. (2010) and Richardson et al. (2016) state that family ownership leads to less tax avoidance. As argued by Chen et al. (2010), family owners fear harm in their reputation and penalties that could happen due to tax avoidance tactics. Their results reveal that family owners show less tax-aggressive behaviour than non-family owners. This is also supported by Landry et al. (2013), who concentrated on Canadian firms. They discovered in their study that family-owned firms show less tax aggressive behaviours. Initially, they assumed this effect is caused by the corporate social responsibility factor. Families would not prefer tax avoidance benefits more than the possible reputational damage and other tax avoidance costs in order to protect the family's name and image. The assumption is that this kind of firms would be also more corporate social responsible due to that. They would ensure good CSR status to sustain a good image. In their study, they added family ownership as moderating effect between corporate social responsibility and tax aggressiveness (researchers term, which encompasses tax avoidance, evasion and planning). Contrary to their hypothesized effect, family-owned firms show lower corporate social responsibility scores than non-family owned firm. Still, whether corporate social responsible or not, family ownership has a negative effect on tax avoidance according to their results.

There seems to be disagreements in research regarding family ownership of firms. Nevertheless, as mentioned earlier Indonesia has a rather concentrated ownership environment (Masripah et al., 2015; Utama et al., 2017), hence we follow the argumentation of Annuar et al. (2014) about Maylasian family-owned firms and chose the following hypothesis:

H1: Family ownership of Indonesian mining firms has a positive effect on tax avoidance.

2.4.2 State Ownership

Shleifer and Vishny (1994) mention a conventional view, which states that the aim of governments as owners of public firms is to maximize social welfare as well as avoiding the monopoly power

of private firms. They also state that SOEs ensure prices, which reflect social marginal costs, hence fair prices. Moreover they perform well.

In the case of Azerbaijan, Iraq and Yemen for instance, the state-owned mining firms next to petroleum ones contribute to more than two third of the governments revenues[43]. Those revenues then can be invested in public funds and development (Sudibyo & Jianfu, 2016). Intuitively, tax avoidance would be naive, since it would reduce the government revenues again.

Indonesia belongs to the top countries enhancing state owned corporation's accountability. This means they provide regulations regarding publishing reports, disclosing audits and transparency and compliance with international accounting standards for example[44]. Thus, one could argue that these regulations decrease the possibility and easiness of tax avoidance mechanisms for state-owned firms. Furthermore, the country's development is key to the government and by this the state would seek to tackle development issues, which could be caused by tax avoidance[45].

These assumptions are supported by the study of Chan et al. (2013), who found that SOEs show a less tax-aggressive behaviour compared to the ones not controlled by state. They argue that the reason could be that executives of the SOEs might benefit from promotions or career opportunities offered by the state and want to satisfy the state by not harming the states revenues. Important to note is that in contrast, the results of Chan et al. (2013) conveyed that the negative relationship between state-ownership and tax avoidance diminishes in less-developed countries with weak corporate governances. Similar findings are reported by La Porta et al. (2007). They found that firms located in countries with poor investor protection regulations are largely owned by a family or the state, indicating that state ownership does not necessarily lead to better investor protection. Hence agency conflicts can arise and decisions regarding tax payments can be biased and aimed to benefit the major shareholders.

The state's role regarding business regulations, hence investor protection, is different in civil law countries, which seems to derive from history (La Porta et al., 1999). Whereas in common law countries such as England, the crown partially lost control of the court to the parliament and

43 Natural Resource Governance Institute State-Owned Companies. Retrieved from https://resourcegovernance.org/resource-governance-index/report/state-owned-companies
44 Natural Resource Governance Institute State-Owned Companies. Retrieved from https://resourcegovernance.org/resource-governance-index/report/state-owned-companies
45 Parliamentary Monitoring Group (2006). Tax Avoidance Discussion Thesis: briefing by SARS and National Treasur . Retrieved from https://pmg.org.za/committee-meeting/6500/

property owners in the 17th century, in civil law countries such as Germany, parliament power was weaker with the adoption of commercial codes in the 19th century (La Porta et al., 1999). The state maintained control over firms, not the property owners nor parliament. This could indicate that in order to maintain the position, the state does not have an agenda in protecting other investors than itself. This is a possible argument for the fact that civil law countries have weak private property/ investor protection than common law countries (La Porta et al., 1999).

These developments additionally support rather the assumption that state ownership in firms located in civil law countries leads to tax avoidance due to weak shareholder protection. Hence, since Indonesia follows the civil law (Tran, 2017), state ownership in Indonesian firms would lead to the firm's tax avoidance.

Moreover, Shleifer and Vishny (1994) contradict the conventional view that the state as owner would enact on best interest for the country's development. They argue that politicians of such SOEs use their control for selfish goals. Such goals could be hiring political allies and control prices for political aims. This argument is supported by the findings of Mafrolla (2019), who studied tax avoidance of SOEs in Italy. Their results showed that by affecting the corporate accounting policies, the state-owned firm avoided corporate taxes. Here, they distinguish national and local government, the latter having a significant positive effect on tax avoidance, whereas the results of national government as owner were as well positive but not statistical significant. Their argumentation for this is that local government owned firms might be less interested in tax revenue since they are not the direct tax collector. Furthermore, the owners exercise their political power over their owned local companies. They prefer the tax savings for cost minimization and profit maximization.

According to the study of Sudibyo and Jianfu (2016) on manufacturing firms, political connected firms had to pay less corporate income taxes. The assumption is that SOEs have political connections and better network with tax authority, by this they can manage taxes well compared to other firms. If this is the case, then state ownership in Indonesia would lead to tax avoidance since there it is tradition that current or former politicians have board positions in SOEs (Sudibyo and Jianfu, 2016). Taking the principal to principal perceptive here, controlling state owners seem to use insider information and powerful networks for personal benefits, hence expropriating minority shareholders.

Based on above-mentioned theoretical arguments the study's assumption is that in the case of Indonesia, state ownership and tax avoidance have a positive relationship. Indonesia is a developing country with civil law. Having weaker corporate governances, while being known to have current or former politicians as board members, convinces to formulate the following hypothesis:

H2: State ownership of Indonesian mining firms has a positive effect on tax avoidance.

2.4.3 Domestic Ownership

Indonesian mining firms have institutional owners as well (Reyes, 2017). Nevertheless, whereas ownership types are addressed, not much was found on the distinction between domestic corporate and institutional owners. Such a distinction is necessary, since these types have difference resources capacities and probable different goals. In order to indicate a possible effect on tax avoidance, this thesis relied on only few papers mainly investigating their role on other firm factors such as performance. This way, this thesis can make assumptions regarding the probable effect of domestic ownership on tax avoidance and also perhaps provide foundations for further research on domestic ownership and tax avoidance.

2.4.4 Domestic Corporate Ownership

Douma et al. (2006) conducted research on firm's ownership structure including domestic ownership on firm performance in emerging markets and found that domestic owners lead to increased firm performance. In their study, they also included the aspects of the institutional context and firms' resource capacities. According to the authors, domestic corporate shareholders in India represent the largest shareholders there with the perspective of long-term investments.
Compared to domestic financial holders, domestic corporate ones would rather like to encourage competition and have non-financial goals. They have strategic goals such as acquiring and being acquired in order to sustain their core competences and find it important to monitor the firms well. The likelihood of being taken over increases with the number of large corporate shareholders (Douma et al., 2006).

The good firm performance by domestic corporate owners is also argued by other researchers, who argue that the positive relationship can be explained by the home equity bias. What it means is that investors seem to rather invest in firms based in their home country instead

in foreign firms (Solnik & Zuo, 2017; Van Nieuwerburgh & Veldkamp 2010). They can benefit by information asymmetry on their equity markets (Amadi, 2011). An underlying assumption is that the domestic investors are specialized in their home assets (Van Nieuwerburgh & Veldkamp, 2010). One can assume that due those home asset specializations and knowledge, home investors seek to compete suiting the information advantage theory (Fedenia et al., 2017).

Corporate shareholders do not entail much resources, except when they belong to business groups (Douma et al., 2006). If the domestic corporation as owner is not an institutional one with large amount of resources such as financial ones, it might be counterproductive for a domestic corporation to control another domestic corporation, which operates in a totally different industry. Lack in industry experience and knowledge might lead to business failure and loss of profit, hence low return on investment. Taking this into consideration one might argue that in case the firm is owned by a domestic corporation, it is owned by one which has similar industry experience and knowledge to add in order to increase firm value. Thus, the objective is long-term value. Extensive tax avoidance tactics and their costs would by this not be beneficial and desired by the domestic corporate owners, since they would decrease the firm value due to the discount risk, reputational damage and agency conflict as mentioned before. In addition, the strategic view and goal of the domestic corporate owner to acquire other firms or be acquired by larger ones, also entails that domestic ownership seeks to have better monitoring approaches compared to domestic financial ones (Douma et al., 2006). Their intend to monitor the firm suggests lower agency conflicts. To note here is that this effect would be mitigated when the corporation belongs to a business group. Firms, who aim at being taken over and put emphasize in monitoring, such as domestic corporations as owners do, would not seek private benefits (Mishra, 2013) such as tax avoidance benefits.

Compared to domestic institutional owners, domestic corporate owners do not have the required (financial) resources and network to be able to find loopholes in tax regulations and to avoid taxes legally. This study postulates they would not solely have interest in avoiding taxes and rather aim at strategic goals like entering new markets and provide good performance as argued by above mentioned researchers.

The strategic approach of domestic corporations and its positive effect on firm value, shown by Douma et al., (2006) and Sivathaasan (2013), would indicate that the tendency to avoid

taxes and harm the firm's reputation in the market is rather unlikely in the case of domestic corporate ownership.

By this the next hypothesis is:

H3: Domestic corporate ownership of Indonesian mining firms has a negative effect on tax avoidance.

2.4.5 Domestic Institutional Ownership

As emphasized before, one should differentiate between the effects of domestic corporate and domestic institutional ownership on the firm due to their different resource abilities and views. In this section, this study refers also to literature regarding domestic institutional ownership and firm performance as well as governance in order to be able to link domestic institutional ownership's probable effect on tax avoidance and to indicate the direction of their relationship.

In the case of the Malaysia, after the Asian Financial Crisis of 1997, institutional investors seem to have contributed highly to Malaysia's shareholder protection (Wahab & Rahman, 2009). Additionally, Aggarwal et al. (2011) found in their research that international institutional investors contributed significant positively to firm-level governance. They were more likely to terminate CEOs, who performed poorly and increased valuation over time.

Graham et al. (2014) claimed that firms with high institutional ownership tend to care more about the financial reporting consequences of tax planning approaches and regard the negative impact of financial accounting risk as important. Other papers (e.g., Boone & White, 2015) found that institutional investors additionally monitor management disclosures, which also benefits other shareholders, and this leads to lower agency costs. Furthermore, institutional investors like financial ones are typically monitored themselves by public authorities. Krivogorsky (2006) investigates the role of institutional owners on firm profitability of 87 firms and found a positive relationship.

According to Thomsen and Pedersen (2000) institutional owners are known for their arm's length relationships with the firms and are specialized as owners, by this they contribute to shareholder value and performance. Though they seem to not necessarily have large ownership in the firms, other study results as well have supported Thomsen and Pedersen's (2000) hypothesis as quoted by themselves (McConnell and Servaes 1990; Levin and Levin 1982; Nickel et al., 1997).

Douma et al. (2006) emphasize that in emerging and transition economies such as Indonesia external mechanisms are less well-developed, so the effects of institutional owners on firms' performance might be different. According to their study, the results between domestic corporate owners and domestic institutional owners differ, being the domestic corporate owners the only ones significantly affecting firm performance positively. The same is argued by Aggarwal (2017) stating that the level of domestic institutional role on firm's governance or performance depends not only on the firm but also countries legal environment. Furthermore, Aggarwal's (2017) results show that rather foreign instead of domestic institutional investors lead to an independent board of directors and that domestic institutional investors are the main contributors towards improved governance in common law counties, whereas in civil law countries rather foreign institutional investors provide a positive effect on firm's governance improvement.

When taking the agency perspective, if the firm performance and value seems not to be a goal (Douma et al., 2006; Giannetti & Laeven 2009), one can assume that rather personal benefits such as tax avoidance benefits are more relevant for this type of owner.

Bayar et al. (2018) and Huseynov and Klamm (2012) investigated the relation between institutional ownership and tax avoidance. Both study findings show that institutional ownership leads to tax avoidance. Huseynov and Klamm (2012) include the aspects of institutional owners on firms CSR and find that they are negatively correlated with firm's CSR strength and community concerns. First, they argue that the positive relationship could be due to the institutional owners greater monitoring of managers and requirements of them to reduce taxes, in order to increase shareholder value. Nevertheless, since their results showed that institutional ownership does not contribute to CSR aspects (support for charities via e.g. tax savings, ownership transparency, tax audits, limited compensations) and to community concerns, one can assume that institutional owners would reduce taxes for own benefits.

Bayar et al. (2018) found a positive effect of institutional ownership on tax avoidance, which is stronger for firms with strong governance. Those have significant higher shelter scores, meaning they take advantage of tax shelters. This effect seems to be based on the fact that institutional ownership in firms with strong governance are able to manage taxes well such as using tax shelters and this leads to the reduction of the firm's financial distress. If the firm has bad corporate governance, tax avoidance would then only benefit specific parties such as managers and this would be overlooked in such environments with weak monitoring. But in a good corporate

governance environment, the interests of the firm's parties are aligned and shareholder value can be created with tax avoidance (Bayar et al., 2018)

Considering above findings leads to the assumption that institutional ownership in Indonesia would rather lead to tax avoidance, since the country deploys the civil law[46] with weak shareholder protection. Prior research also indicates that domestic institutional ownership does not lead to firm performance, hence the owners might not intent to achieve long horizon goals for the firm. Rather tax avoidance could be on the agenda to ensure short-term goals such as tax savings or refunds. Second, domestic institutional owners also tend to have more resources than domestic corporate ones. Thus, they would be able to afford good tax management and experts in order to avoid taxes efficiently.

The above-mentioned findings lead to the following hypothesis:

H4: Domestic institutional ownership of Indonesian mining firms has a positive effect on tax avoidance.

2.4.6 Foreign Ownership

The other group of large shareholders are foreign investors. Foreign owners tend to have large shareholdings in emerging countries (Douma et al., 2006). Moreover, Kang and Stulz (1997) found that foreign holdings in firms with large export sales was substantial. Taking these findings into consideration one could assume that mining firms in Indonesia, due to the export sales and the emerging market, would by this be largely owned by foreign owners. On the other hand, other studies state that in countries with poor shareholder protection, firms seem to be largely owned by officers, directors or families (Dahlquist & Robertsson, 2001). More research is required to provide a better overview regarding the ownership in emerging countries.

Douma et al. (2006) observed that foreign owners show a significant positive relation towards firm's performances, which is supported by Dharwadkar et al. (2000). They observed that foreign investors (outsiders) could solve expropriation conflicts and reduce expropriation problems, especially because they tend to be watched by the government and by this are more

[46] Silitonga, G., I., L., Candra, S., Hamzah, H., Roosdiono & Partners (2018). Legal systems in Indonesia: overview. Thomson Reuters Practical Law. Retrieved from https://uk.practicallaw.thomsonreuters.com/w-010-7310?transitionType=Default&contextData=(sc.Default)&firstPage=true&bhcp=1

constrained compared to domestic investors. Hence, due to the higher monitoring by the government, they might not be keen to apply aggressive tax avoidance techniques

According to Love et al. (2009) foreign owners can provide competitive advantage, which is knowledge based. They argue that foreign owned firms perform better than domestic owned firms.

Nevertheless, the findings of Dahlquist and Robertsson (2001) showed that there was no significant effect of foreign investments on firms' ROA and beta. According to the study results of Douma et al. (2006), foreign shareholders have a positive effect on firm performance, nevertheless this could also be explained by the fact that foreign firms might choose well performing corporations. Another advantage according to them is that foreign shareholders are capable of using the institutional environments for their advantage with their resources and skills.

The findings, which state that foreign ownership adds to firm specific variables such as performance, could indicate that those firms on the other hand might not require tax avoidance techniques in order to retain revenue. They would be able to increase their revenues by their performance and resources like knowledge. On the other hand, firms with high net profit before tax might not want to lose much money on corporate taxes. One of the few studies addressing foreign holders and tax avoidance is Demirgüç-Kunt and Huizinga (2001). They found that foreign shareholders have a positive relationship towards tax avoidance. Due to simplified international portfolio investments and regulations as well as foreign branches, they are able to make use of foreign tax credits and profit shifting opportunities. The positive relationship is also supported by Van Gelder et al. (2016), who observed that the mining firms in their study have a Dutch company as ultimate foreign holding company. They found that foreign holders rather lead to tax avoidance by e.g. paying dividend to Dutch holding firms. Via the holding firms it is not easy to follow the transactions and with the benefit of foreign tax credits, they aim at reducing earnings. They seek to benefit by the tax savings. Positive association between foreign shareholders and tax avoidance is also supported by Annuar et al. (2014). In their research on ownership structure and tax avoidance in Malaysia, they found a positive relationship supporting the findings of Van Gelder et al. (2016) and Demirgüç-Kunt and Huizinga (2001).

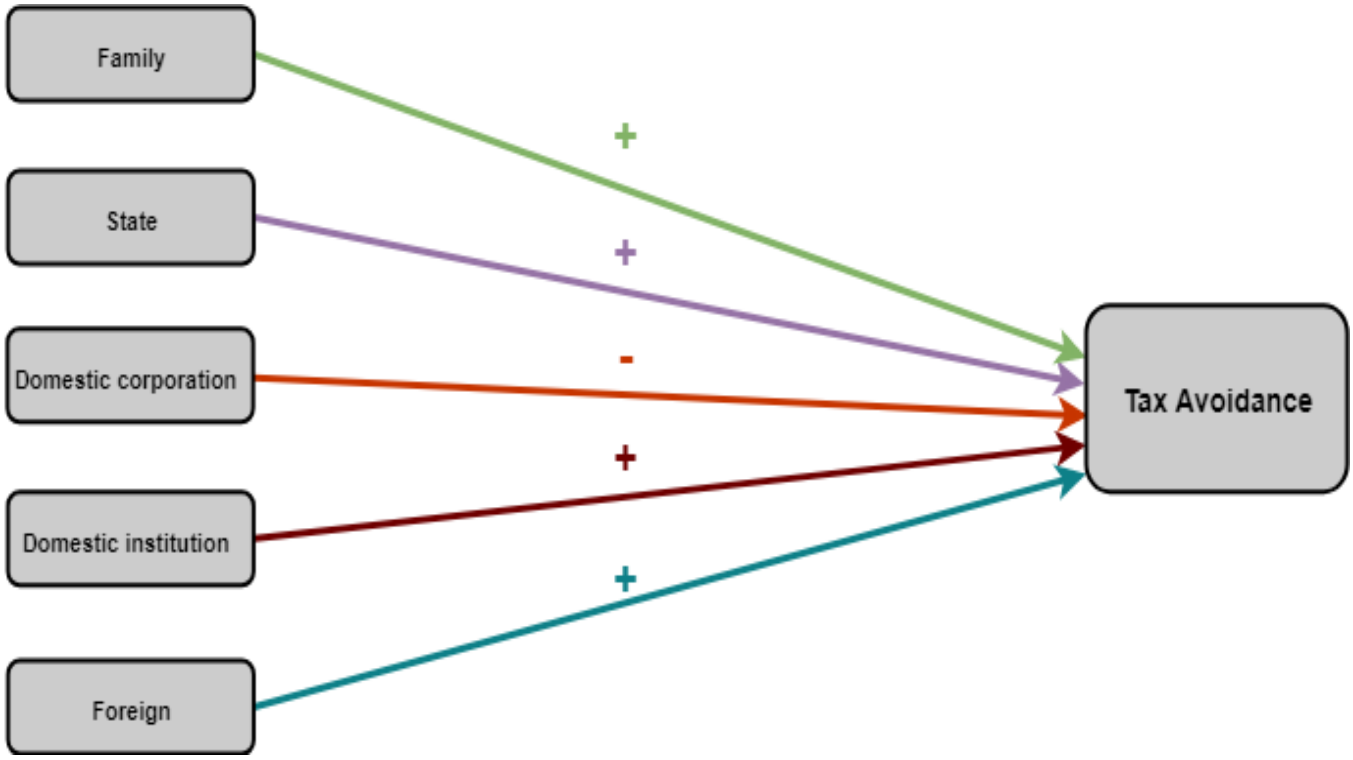
By this, our hypothesis is:

H5: Foreign ownership of Indonesia mining firms has a positive effect on tax avoidance.

2.5 Conceptual Model

The next figure illustrates the hypothesized relationships between the independent variables (ownership structure) and tax avoidance. As illustrated, it is hypothesized that domestic corporations as owners does not lead to tax avoidance, whereas domestic institutional, family, state and foreign lead to tax avoidance.

Figure 3: Conceptual Model Ownership structure and Tax avoidance



3 RESEARCH METHODOLOGY

This section provides the research method of this study, the strategy in acquiring the data and the selection of the dependent, independent and control variables used in this study.

3.1 Methodology

3.1.1 Methods Used in Prior Studies

Thus far, most prior research studying ownership structure of firms applied regression analysis. There are different methods to apply regression analysis.

Ordinary Least Squares Regression (OLS)

The ordinary least square method (OLS) is applied in linear regression and aims at determining the line of best fit, i.e., minimizing the squared residuals determined by the deviation from this line (Singh, 2015). This method studies the relationship between one dependent variable and several independent variables. In case one wants to study the relationship between several independent and dependent variables, the Multiple OLS regression is suitable. The goal is to calculate the lowest sum of squared variances in order to find the linear relationship, i.e., the plane of best fit. This process is also called the least square estimation (Singh, 2015). Regarding the least square method in general, it is required that the independent variables need to be uncorrelated and perfect correlation or multicollinearity (case of linear relationship between independent variables) make the method impractical (Singh, 2015).

Badertscher et al. (2013), Jian et al. (2012), Richardson et al. (2016) and Sudibyo and Jianfu (2016) applied OLS regression during their analysis of the relationship between ownership structure and tax avoidance. The authors used panel data. Panel data is a set of data that examines a sample over time enabling multiple observations on each unit of study (Hsiao, 2003). This approach enables to produce more precise predictions for individual outcomes than only time series. One can learn about one units behaviour when examining the others, in case the individual units behaviours are similar conditional on certain variables (Hsiao, 2003).

Baderstscher (2013) added the Heckmann method to the OLS and used a two-stage estimation procedure with the probit regression to correct for selection biases. Baderstscher's (2013) data on ownership structure and tax avoidance is based on firms which are owned by private

equity firms or management teams. Although they argue that private equity firms' choices for acquiring firms are not random (e.g., might be related to target firms' tax planning), hence selection bias might occur. In the first stage, they control for variables such as the firm's age as predictors for private equity ownership. They add the estimated coefficients of the first equation to the second equation in order to observe the relationship of ownership structure and tax avoidance.

Other literature use the fixed-effects/random-effects model (Fernández-Rodríguez et al., 2019) to study the relationship between ownership structure and tax avoidance. In other studies, the logistic regression is chosen or added to the OLS to observe for the likelihood of tax avoidance using other factors such as usage of tax shelters or proportion of outside board members (Bennedsen & Zeume, 2015; Desai & Dharmapala, 2009; Richardson & Lanis, 2011).

A problem with linear regression such as OLS that this method assumes that the relation of the dependent variable is linear. Generalized Linear Model methods like probit and logit regression are able to capture the nonlinearities better than the linear approach (Singh, 2015). In addition, the theory assumes that the error term has constant variance across all observations. The errors are assumed to be *homoscedastic*. But not in all cases are all lines straight. If there is no case of homoscedasticity than *heteroscedasticity* exists, which assumes that the variability in the error is different across observations. Heteroscedasticity is typically accounted for by assuming that the error variance depends on an underlying (in)dependent variable..

Generalized Linear Models (GLM)

The generalized linear model is an extension of OLS. The difference is that GLM incorporates also non-normal and non-interval outcome variables. The error component is independently distributed with a mean of zero and constant variance (Gill, 2011). Compared to standard linear regression, the generalized linear regression uses a function of the mean of Y (link function) instead of using Y as the outcome. GLM helps to predict categorical variables (Gill, 2011)[47]. The next type of regressions Logistic and Probit belong to the GLM.

[47] Martin, G. (nd). The Difference Between Logistic and Probit Regression. Retrieved from https://www.theanalysisfactor.com/the-difference-between-logistic-and-probit-regression/

Logistic Regression

This approach is different than standard regression. Here the maximum likelihood method is applied instead of the least squares method. Logistic regression is used for classification, providing classifications of observations in order to figure out whether observed and predicted events match. This method is about predicting odds. The odd ratio gives the frequencies, which indicate to which category the dependent variable belongs to (Singh, 2015). In other words, with logistic regression the aim is not to find a specific numerical value of the dependent variable but the probability that it is rather 1 than 0. Logit transformation is used to predict values within these units and here p then can range between $-\infty$ to $+\infty$ to find out whether the log (odd) is a linearly related independent variable (Singh, 2015). Since logistic regression deals with probability of events occurring (occurring or not occurring) the relationship of the variables is S-shaped instead of linear (Cramer & Howitt, 2011). The coefficient in the logistic regression displays the change in the logit based on every change of one unit in the predictor variable. Then the coefficient is transformed into estimated odds ratio in order to estimate the likelihood of occurrence (Cramer & Howitt, 2011).

In theory, one should use logistic regression if one assumes that the categorical/ dichotomous variable reflects an underlying qualitative variable, hence logistic regression uses binomial distribution (Singh, 2015). In the study of Richardson and Lanis (2011), the authors applied both techniques, OLS and logistic regression, to study the effect of board of directors on tax avoidance. Both methods yield the same conclusion that having outside directors reduces the chances of tax avoidance. Nevertheless, studies covering ownership structure and tax avoidance did not apply logistic regression, rather OLS or the fixed and or random-effects method.

Probit Regression

Probit regression is related and thus similar to logistic regression. This method transforms the original variable to predict the categorical dependent variable. Also here, the maximum likelihood estimation is applied. The difference between logistic model and probit model is that in the probit model normal distribution is assumed and it uses cumulative distribution function of the standard normal distribution, whereas the logistic regression uses cumulative distribution function of the logistic regression. Simply put, probit regression assumes normal distribution and logistic regression a binominal distribution (Singh, 2015). Another difference between probit and logistic

regression is that probit applies an inverse normal link function and the logistic one uses natural log of the odds ratio for the transformation[48].

Both the logistic and probit regression use the binary distribution of 1 or 0 and both provide similar results, hence decision which method to use is based on own interpretation (Singh, 2015). Bradshaw et al. (2016) and (McGuir e et al., 2014) applied the probit regression when studying ownership structure and tax avoidance, although they did not apply the method directly to study the effect of ownership structure on tax avoidance. They apply it to other variables' relationship effects and their probability, which are related to the hypotheses about ownership type and tax avoidance. By this they want to avoid biases in their results. For instance, they applied the probit model to investigate whether the state-owned firm's tax decisions influence the likelihood that the firm's manager is promoted (Bradshaw et al. 2016) or whether factors such as belonging to a media industry on an IPO date or the state taking over laws during incorporation affect the probability of establishing a dual class ownership structure on the IPO date (McGuire et al., 2014).

Fixed-Effects and Random-Effects Method

The fixed-effects method (FE) or random-effects method (RE) are used to account for group-level variations. In many cases, the dependent variable's variations might not only be explained by the independent variables. Ignoring the nature of other observations might lead to poor and unfit results of the regression (Clark & Drew, 2015). Here, FE and RE methods can be applied in order to control not only for additionally individual influences but also the influence of the difference between them. Changes of the variables over time can be assessed as well (Cooper et al., 2013).

According to Clark and Drew (2015) the random-effects models could reduce the variance of estimates of coefficient but at the same time they can introduce bias under certain conditions. Fixed-effects estimates are not biased, but may be subject to high sample dependence. With the absence of a fixed-effects method it is assumed that the study is gathered from a random sample and not a common population. In the RE method, the variance in effect size does not only reflect the sampling error (which is the case with the FE method), but also includes the study-level random influences. Hence, if it is assumed that there are additional random error sources, then one should decide for the RE model. If one seeks to observe effects about units which are not in the dataset,

[48] Martin, G. (nd). The Difference Between Logistic and Probit Regression. Retrieved from https://www.theanalysisfactor.com/the-difference-between-logistic-and-probit-regression/

FE method is not applicable, since the effects of unobserved units are unknown. In the RE on the other hand this is possible (Cooper et al., 2013).

There is another difference between both methods. In the case of the FE, the assumption is that the true effect size of all studies is equal. If the size varies then it is so because of the error in estimating the effect size (within-studies estimation error). Therefore smaller studies information can be ignored because larger studies with the same effect size provide better information (Borenstein et al., 2010). In other words, larger studies are given more weights.

On the contrary, the RE model does not provide one true effect estimate, but estimates the mean of the effects distribution. It is assumed that all studies have a different effect size, hence between studies is incorporated and the study results are not highly effected by specific studies with high weights. Additionally to base the weights on within-study variance, the RE adds a constant T2 for between-study variance and mitigates the relative differences among the weights (Borenstein et al., 2010).

Given that the FE method assumes that every study has a common true effect size, it assumes homogeneity. Nowadays researchers contradict each other and argue that this specific assumption should not necessarily imply the validity of the FE, so the method can be applied without making this assumption (Borenstein et al., 2010).

There is still little consistent guidance in research regarding deciding which model to use (Clark & Drew, 2015). One indication is if one expects additional random effects influences on the regression variances, then the RE is more appropriate (Cooper et al., 2013). It is also possible to apply both methods simultaneously in order to address differences among the methods results and the research findings and interpretation (Cooper et al., 2013). Nevertheless, deciding for FE or RE seems to be subject to interpretation in research (Lai & Teo, 2008).

One way to help deciding which method to use, is applying the Hausman test. The Hausman test investigates whether there is correlation between the variables and the unit specific effects. In case the independent variables are correlated with the unit specific effects, the null hypothesis of the test can be rejected and the FE should be applied instead of the RE method (Cooper et al., 2013). If there is correlation than bi-directional causality exists. This is known as the endogeneity problem (Kendall, 2015). In our case for instance there would be endogeneity if ownership structure is also determined by tax avoidance.

Nevertheless, one needs to consider that there might always be some correlation between explanatory variables and unit effects. No rejection of the null hypothesis does not necessarily mean correlation is zero but that there might be weak statistical power to differentiate between small and zero correlation (Clark & Drew, 2015).

Fernández-Rodríguez et al. (2019) applied the Hausman test in order to determine whether individual effects are correlated with the independent variables. Although the test suggested the usage of the FE method in their study, they chose for random RE because the FE approach does not allow for estimating the beta of the constant variables over time.

3.1.2 Method of Current Study

This study starts with a univariate analysis of the descriptive statistics. Afterwards a multiple regression analysis is applied with a panel data method. The technique for the panel data analysis here can be once the FE method and once the RE method. Applying pooled OLS model would not be appropriate since that method would ignore the time and individual aspects of the data[49] (Hsiao, 2003). OLS would fail in this case to explicitly account for the distinctive characteristics of the panel data set (Cooper et al., 2013).[50] Also, OLS does not control for unknown variables (Pilos, 2017). Nevertheless, to allow for comparison and additional robustness this study applies another model called first-difference. This method consists of OLS applied to the data, which is generated with the differences in variable values among the consecutive years.

Model 1.

For the first model, this study applies the Durbin Wu Hausman test to find out which model specification (RE or FE) to choose, similar to Fernández-Rodríguez et al. (2019).

For both, either RE or FE, a two-way error component model is applied. This model inspects the unobservable individual-specific effect as well as the unobservable time-specific effect (Baltagi, 2008; Fitrianto & Musakkal, 2016; Wallace & Hussain, 1969) and can be applied for both the fixed-effects and the random-effects (Baltagi, 2008; Fitrianto & Musakkal, 2016).

[49] Alam, M. (2020). Panel data regression: a powerful time series modeling technique. Retrieved 02 July, 2020 from https://towardsdatascience.com/panel-data-regression-a-powerful-time-series-modeling-technique-7509ce043fa8

[50] Alam, M. (2020). Panel data regression: a powerful time series modeling technique. Retrieved 02 July, 2020 from https://towardsdatascience.com/panel-data-regression-a-powerful-time-series-modeling-technique-7509ce043fa8

The following model equation for panel data models with several independent variables is applied (Fitrianto & Musakkal, 2016):

$$Y_{it} = \beta_0 + \beta_1 x_{1,it} + \ldots + \beta_k x_{k,it} + \mu_i + \lambda_t + \nu_{it}$$

where

Y= dependent variable

i= denoting cross-sectional dimension (firm)

t= denoting time

x_{it}= vector of explanatory variable observations

β_k= regression coefficients of the independent variables

μ_i = unobserved individual specific effect

λ_t = unobserved time specific effect

ν_{it} = zero mean random disturbance with variance σ_v^2

The first panel data regression model contains the relationship between tax avoidance, and the ownership structure and control variables.

$$TAXAVOID_{it} = \beta_0 + \beta_1 DOMC_{it} + \beta_2 DOMI_{it} + \beta_3 FOR_{it} + \beta_4 GOV_{it} + \beta_5 FAM_{it} + \beta_6 Size_{it} + \beta_7 DEBT\ RATIO_{it} + \beta_8 ROA_{it} + \mu_i + \lambda_t + \nu_{it}$$

Each of these variables for company i over year t are defined in the upcoming section variable measurement and definitions.

Model 2.

Since this panel data covers 15 years, it is beneficial to examine the yearly changes in the tax avoidance proxies as function of the yearly changes in the ownership structure and control variables. This can be done by the first-difference method, which is based on the OLS equation (Harvey, 1980).

Thus, the second model runs with the first-difference method. The aim is to examine how the variables and the relationship towards the dependent variables change in average over time. So instead of explaining the level of the dependent variable, this model explains the changes of it (Harvey, 1980; Wooldridge, 2010). This transformation takes first differences: variable at time t

minus value of the same variable at time $t-1$ (Harvey, 1980; Longhi & Nandi, 2019; Wooldridge, 2010).

The drawback is that some observations are dropped out because of the differencing (T-1), meaning first year value would be missing (Wooldridge, 2010). In this model, also the individual-specific effect cancels out because they are the same over the years and coefficient of time invariant variables cannot be identified here (Longhi & Nandi, 2019). In this study for instance, the changes of the dependent variable cannot be driven by the individual-specific effect firm id, because id is time invariant and cannot change over time and. Hence, firm id cannot change the dependent variable. Because of that the first-difference method could provide a better estimate for the causal effect measurement. A comparison between the two-way error component model and this model, hence a comparison between the effect of the explanatory variables on the dependent variable itself and once on its change, can provide more insights and robustness.

The following formula is followed (Harvey, 1980; Longhi & Nandi, 2019; Wooldridge, 2010) (Harvey, 1980; Longhi & Nandi, 2019):

$$\Delta TAXAVOID_{it} = \beta_0 + \beta_1 \Delta DOMC_{it} + \beta_2 \Delta DOMI_{it} + \beta_3 \Delta FOR_{it} + \beta_4 \Delta GOV_{it} + \beta_5 \Delta FAM_{it} + \beta_6 \Delta Size_{it} + \beta_7 \Delta DEBT\ RATIO_{it} + \beta_8 \Delta ROA_{it} + \nu_{it}$$

The analyses are performed with the statistics software Stata. The thesis's panel data is unbalanced, since we miss data from some companies for given years.

3.2 Variable Measurement and Definitions

In this section, all variable measurements and definitions are provided as well as justification of selection. The section is followed by an overview of the measurements and definitions presented by Table 3.

3.2.1 Dependent Variables

Tax Avoidance

For this study, several proxies to study tax avoidance behaviour of the mining firms are used, which improves the robustness of the studys results.

ETR and CETR

In literature, two variables are most apparent for identifying tax avoidance characteristics due to their capability of being compared across firms. Most recent studies used the effective tax rate and cash effective tax rate of a firm as a proxy such as Bayar et al. (2018), Chan et al. (2016), Chen et al. (2010), Graham et al (2014), Kiesewetter and Manthey (2017), Masripah et al. (2016) and Van der Pilos (2017).

The firm's ETR is its total income tax expense dividend by the profit before tax (Bradshaw et al., 2016; Chan et al., 2016; Richardson et al., 2016), and displays tax avoidance strategies directly affecting the net income (McGuir e et al., 2014). In this study, following formula is used for effective tax rate $ETR_{i,t}$for firm *i* at time *t, i.e.,*

$$ETR_{it} = \frac{Total\ Current\ Income\ Tax\ Expense_{it}}{Profit\ Before\ Taxes_{it}}$$

Tax avoidance is higher, when ETR is lower (Bradshaw et al., 2016). Furthermore, ETR serves as a good variable since it is a relevant benchmark to compare firms (Graham et al., 2014).

The CETR is based on cash taxes paid in year t divided by the profit before tax in the same year adopted from Bradshaw et al. (2016), Chen et al. (2010), Graham et al. (2014) and Mafrolla (2019). Following formula is used for the cash effective tax rate $CETR_{i,t}$for firm *i* at time *t*:

$$CETR_{it} = \frac{Cash\ Income\ Taxes\ Paid_{it}}{Profit\ Before\ Taxes_{it}}$$

With the CETR, one can observe changes in cash paid taxes among the years and investigate the activities underwent leading to lower CETRs and by this to tax avoidance (McGuir e et al., 2014). Also tax deferral strategies can come to light by looking and comparing, compared tp the ETR CETRs (Khan et al., 2017). Lower CETR leads to higher tax avoidance (Bradshaw et al., 2016).

ETR and CETR data were calculated using data from the firm's income statement and balance sheet. For both variables the methods of Bradshaw et al. (2016), Dyreng et al. (2008), Kiesewetter and Manthey (2017) and McGuire et al. (2014) are adapted. Special items are adjusted.

In case firm's ETR or CETR is below zero or above one, they are set equal to zero (one) and the measures of tax avoidance (ETR and CETR) are winsorized to be between 0 and 1.

Profit Before Tax

Although profit before tax (PBT) is not considered as a proxy variable or indicator for tax avoidance in literature, except in the report of Van Gelder et al. (2016), this study considers this variable as a relevant proxy. This study argues the following. It is questionable and dubious if a firm mentions negative PBT on its financial statement for many years, especially a mining company, which apparently contributes to a large extend to Indonesia's GDP and export earnings due to its operations. PBT could be an indicator that the firm tends to decrease its profit before tax continuously on purpose in order to avoid paying income taxes. Hence, the firm might shift/ tunnel the profit like Enron did for instance[51], in order to reduce the amount and to probably even receive tax refunds. For instance, mining companies could misreport volumes and values of assets or prices of commodities to shift the profits. Profit could also be shifted via reports of patent and royal payments to jurisdictions with lower tax rates as elaborated before, or interest payments (Van Gelder et al., 2016).

Thus, another indirect variable for tax avoidance is the continuous variable firm's profit before tax. Therefore, the yearly profit before tax (PBT) of the firms is gathered and it is investigated whether specific type of owners lead to lower PBT.

3.2.2 Independent Variables

This section covers the measurement methods of the independent variables, control variables and dummy variables (individual-specific and time-specific).

Ownership Structure

A major share of literature concerning ownership structure applies dummy variables instead of percentages of shares of the controlling owner (among others Chan et al., 2016; Cullinan et al., 2012; Mafrolla 2019; Maury 2006; Peljhan et al., 2020; Pindado et al., 2008; Prabowo et al., 2014;

[51] Johnston, B., D. (2003). Tax Shelters Helped Enron Fabricate Profits, Senate Is Told. The New York Times. Retrieved from https://www.nytimes.com/2003/02/13/business/tax-shelters-helped-enron-fabricate-profits-senate-is-told.html

Sacristán-Navarro et al., 2011; Sudibyo & Jianfu 2016). Nevertheless, the authors did not provide justifications for the selection of dummy variables. Other literature uses percentages of shares (Al-Fayoumi and Abuzayed 2009; Gaaya et al., 2017; Saleh et al., 2017; Unite & Sullivan 2003).

For the sake of robustness, this study uses percentages of shares hold by the controlling owners as well as dummy variables for all type of owners. Thereby, this study can compare the results with different studies. For all type of owner variables this study follows Al-Fayoumi and Abuzayed (2009), Chen et al. (2010), Kim and Ouimet (2014), Maury (2006) and Sudibyo and Jianfu (2016) and considers a controlling holder if the holder owns 5 % or more shares of the firm (*note: firms might have several controlling owners in the considered period*).

The database of Orbis helps to identify the firms' owners. In Orbis, following abbreviation are used for type of owners [52]:

F = Financial company	B = Bank
Z = Public	S = Public authority, state, government
I = One or more named individuals or families	E = Mutual and pension fund, nominee, trust, trustee
C = Corporate	A = Insurance company

In order to avoid misinformation, the types given by Orbis were compared with financial reports and other internet sources before using the ownership data in the analysis. Nevertheless, on a number of occasions during the data collection, some given type of owners were not accurate. For instance, whereas Orbis indicated corporate ownership, the owner was an institutional owner instead. Also, unfortunately Orbis does only have ownership data for couple of past years. Hence, financial reports and other internet sources were used in order to find the type of owner in a given year.

Family Ownership

Since family ownership is not directly measurable, indirect variables are used. This study codes one if family members control more than 5 % of the firm and zero otherwise. Nevertheless, finding ownership information regarding family members is difficult and due to lack of sufficient data, this study counts an individual owner owning 5 % or more also as family owner (similar to the study of Masripah et al., 2016; Maury & Pajuste, 2005; Pindado et al., 2008; Thomsen & Pedersen,

[52] Orbis Database

2000). Other papers defined firms as family owners if they are not owned by other ownership types such as state and companies (Lee et al., 2018).

State Ownership

Regarding the ownership by the state, the measurement method as suggested by Chan et al. (2016), Mafrolla (2019), Prabowo et al. (2014) and Sudibyo and Jianfu (2016) is applied. The firm is state-owned if the state holds more than or equal to 5% of the firm's shares.

Domestic corporate, domestic institutional and foreign investor ownership

For the selection of the independent variables, the explanatory variables used by Douma et al. (2006) are adopted. Their study covered the effect of different types of owners on firm performance in emerging markets including the impact of domestic and foreign shareholders. They distinguish the domestic owners into corporations and institutional ones and add the business group affiliation of the firms. This study's indication regarding domestic and foreign owners is based on their variable indications.

For the domestic ownership, they choose the abbreviations DOM for domestic owners, and FOR for foreign owners. Assuming there is a difference between corporate and institutional holders, they divide it further into foreign institutional owners (FORI) and foreign corporate owners (FORC) as well as domestic institutional (DOMI) and domestic corporate owners (DOMC). In contrast, in this thesis the focus lies on foreign owners in general, i.e., it distinguishes FOR with domestic institutional (DOMI) and domestic corporate owners (DOMC). FOR, DOMC and DOMI are controlling holders if they own more or equal to 5% of the firms' shares.

By institutional owners this thesis defines banks, insurance firms, pension funds and mutual funds as also suggested by Aggarwal et al (2011), Aguilera and Jackson (2011), Douma et al. (2006), Saghi-Zedek and Tarazi (2015). Although Saghi-Zedek and Tarazi (2015) excluded banks in its definition and added it as separate independent variable.

Public Ownership

This study covers public Indonesian Mining companies trading in the IDX stock exchange, hence the firms are also owned by minority owners. The listed companies add the ownership hold by all minority shareholders, who own less or equal to 5%, together and provide the number in their

annual reports. In case the total amount of public ownership is 5% or more, it is as well considered as controlling ownership in this study. In this dataset, public ownership seems to be a controlling owner in 97% of the cases. Reporting the effects of public ownership might as well reveal noteworthy findings as well, since public ownership of the Indonesian mining companies stands for the total of all minority shareholders. As stated earlier, minority and majority shareholders interest might differ and as the agency theory argues, majority (controlling) shareholders might make decisions serving personal interests and exploit minority shareholders. Therefore, the findings on public ownerships effects on tax avoidance might be different. Nevertheless, no direction of public ownership is hypothesized in this study. The inclusion of this variable is solely for the sake of completeness of the data since all ownerships having 5% or more shares are accounted for in this study. Notable is that no prior research referred to in this study about ownership structure, covered the aspects of public ownership.

Public ownership is reported as percentages as well as dummy variable just like the other ownership types. For this variable the abbreviation PUB is used.

Control Variables and Dummy Variables

Other variables that might have an effect on the relationship between the firm's ownership structure and tax avoidance, are tested in order to check for the robustness of the empirical results. These are the firm-level factors size, leverage and ROA.

Size

Large firms might be keener to benefit from economic of scale by tax avoidance. Also there is the assumption that larger firms might have more resources than smaller firms in order to have good tax planning mechanisms and by this are able to reduce taxes (Shevlin & Porter (1992) as cited by Chan et al. 2013). Although due to larger size, firms might also fear reputational damage, which might prevent tax avoidance (Chan et al., 2013).

Prior papers apply different methods for size. They use natural log of sales. Some use natural log of totals assets (Aggarwal et al., 2011; Al-Fayoumi & Abuzayed 2009; Huseynov & Klamm 2012; Richardson et al., 2016), whereas some other studies used natural log of sales, such as Douma et al. (2006) and Maury (2006). Others apply the log of the market value of equity as

proxy for size (Suk & Zhao, 2017). This study follows Douma et al. (2006) and Maury (2006) and use natural log of sales as indicator for firm size.

Leverage

Due to the tax deduction benefit of debt the firm might not engage in additional tax savings by lowering ETR and CETR. In case of lower ETR and CETR, one could argue that the firm does not prefer debt financing and uses other tax deduction mechanism such as tax shelters, which is supported by the study of Lim (2011). They found a negative impact of tax avoidance on the cost of debt of Korean firms. Also Graham and Tucker (2006) report that firms engaging in tax shelters use less debt. Thus tax avoidance might replace the need of tax deductions by debt. Hence, firms with high debt ratio probable have higher ETR and CETR.

Firms leverage can be assessed by using the ratio long-term liabilities divided by total assets (Badertscher et al., 2013; Bayar et al., 2018; Gaaya et al., 2017; Landry et al., 2013; Masripah et al., 2016; Richardson et al., 2016; Tang, 2019). Other studies, which covered ownership structure and specific firm characteristics applied the debt to equity ratio total debt to equity (Saleh et al., 2017) or total debt divided by total asset (Annuar et al., 2014; Fernández-Rodríguez et al., 2019; Gaaya et al., 2017; Peljhan et al., 2020; Ruiz-mallorquí & Santana-martín 2011; Sacristán-Navarro et al., 2011; Sivathaasan 2013). This study applies the measurement method long-term liabilities by total assets to control for firm's leverage.

ROA

Profitable firms with high returns might prefer locking their revenue by tax avoidance tactics. The study of Huseynov & Klamm (2012) found a negative relation between ROA and ETR, though the effect of ROA on CETR was positive. Another view here would be that profitable firms also would fear losses due to e.g. reputation and bad branding when linked to tax avoidance behaviours indicating a positive effect on CETR and ETR. Firm's profitability can be measured by using different methods. The most common ones are the firm's ROE, ROA and Tobin's Q.

This study uses ROA as firm's profitability similar to Douma et al. (2006), Gaaya et al. (2017), Huseynov & Klamm (2012), Maury (2006) and Thomsen and Pedersen (2000) and uses the ratio profit before tax by total assets (Brown & Caylor 2006; Gaaya et al., 2017; Richardson et al., 2016). To note is that ROA is not used as controlling variable in the regression analysis with the

independent variable profit before taxes. ROA is based on PBT, hence a high correlation would exist and this would cause biases in the regression results..

Dummy Variables

Since we have a panel data analysis time-specific as well as individual-specific dummies will be added. This dataset does not cover different industries but the firm id could as well affect the analysis. For instance, one firm might be older or larger or affect the analysis in some other way. Hence, this study choses firm (id) to account for individual-specific effects (Bennedsen & Zeume, 2015; Lim, 2011). A dummy variable for each firm (as other do for industry effects) and for each year are used in the analysis to control for their effects (Chen et al., 2010; Fernández-Rodríguez et al., 2019; Richardson et al., 2016; Sacristán-Navarro et al., 2011).

The specifications of the all variables and their measurement can be gathered from Table 3.

Table 3. Definition and measurements of Variables

Concept	Variables	Measurement	Symbols	Reference
TAX AVOIDANCE	Effective Tax Rate	Tax Expense as a ratio of total tax expense to profit before tax of entity $\boldsymbol{i}$ in year $\boldsymbol{t}$ $\frac{total\ current\ income\ tax\ expense_{i_t}}{profit\ before\ tax_{i_t}}$ ETR is set to 0 if ETR < 0; ETR is set to 1 if ETR > 1	ETR_{i_t}	Bradshaw et al. (2016), Chan et al (2016), Richardson et al. (2016)
	Cash Effective Tax Rate	Cash Taxes Paid as a ratio of cash income taxes paid to profit before tax of entity $\boldsymbol{i}$ in year $\boldsymbol{t}$ $\frac{cash\ income\ taxes\ paid_{i_t}}{profit\ before\ tax_{t_t}}$ CETR is set to 0 if CETR < 0; CETR is set to 1 if CETR > 1	$CETR_{i_t}$	Bradshaw et al. (2016), Graham et al. (2014); Mafrolla (2019), Chen et al. (2010)
	Profit Before Tax	Profit Before Tax of entity $\boldsymbol{i}$ i in year $\boldsymbol{t}$ is negative If Profit Before Tax is negative dummy 1; 0 if otherwise	PBT_{i_t}	Van Gelder et al. (2016)
OWNERSHIP STRUCTURE	Family	Family or Individual holds > = 5% Dummy 1 if owned by family/ individual; 0 if otherwise	FAM	Masripah et al. (2016) ,Maury & Pajuste (2005), Pindado et al. (2008), Thomsen & Pedersen (2000)
		Percentage of ownership by family/ individual	FAM %	Al-Fayoumi & Abuzayed (2009), Gaaya et al. (2017), Saleh et al. (2017) and Unite & Sullivan (2003)
	State	Government holds > = 5% Dummy 1 if owned by state; 0 if otherwise	GOV	Chan et al. (2016), Mafrolla (2019), Prabowo et al. (2014), Sudibyo & Jianfu (2016)
		Percentage of ownership by state	GOV %	Al-Fayoumi & Abuzayed (2009), Gaaya et al. (2017), Saleh et al. (2017) and Unite & Sullivan (2003
	Domestic corporation	Domestic corporation holds > = 5% Dummy 1 if owned by domestic corporation; 0 if otherwise	DOMC	Douma et al. (2006)
		Percentage of ownership by domestic corporation	DOMC %	Al-Fayoumi & Abuzayed (2009), Gaaya et al. (2017), Saleh et al. (2017) and Unite & Sullivan (2003
	Domestic institutional	Domestic Institutional holds > = 5% Dummy 1 if owned by domestic institution; 0 if otherwise	DOMI	Douma et al. (2006)

		Percentage of ownership by domestic institutional	DOMI %	Al-Fayoumi & Abuzayed (2009), Gaaya et al. (2017), Saleh et al. (2017) and Unite & Sullivan (2003
	Foreign	Foreign firm holds > = 5% Dummy 1 if owned by foreign firm; 0 if otherwise	FOR	Douma et al. (2006)
		Percentage of ownership by foreign firm	FOR %	Al-Fayoumi & Abuzayed (2009), Gaaya et al. (2017), Saleh et al. (2017) and Unite & Sullivan (2003)
	Public	Public holds > = 5% Dummy 1 if owned by public; 0 if otherwise	PUB %	
CONTROL VARIABLES	Size	Size of of entity $\boldsymbol{i}$ i in year $\boldsymbol{t}$ Natural log of total sales	$SIZE_{i_t}$	Douma et al. (2006), Maury (2006)
	Leverage	Financial leverage of entity $\boldsymbol{i}$ i in year $\boldsymbol{t}$ $\frac{long - term\ labilities_{i_t}}{total\ assets_{i_t}}$	LEV_{i_t}	Landry et al. (2013), Masripah et al., (2016), Tang (2019).
	Return on Assets	Profitability of entity $\boldsymbol{i}$ i in year $\boldsymbol{t}$ $\frac{profit\ before\ tax_{i_t}}{total\ assets_{i_t}}$	ROA_{i_t}	Brown & Caylor (2006), Gaaya et al. (2017), Richardson et al. (2016)
	Individual-specific effect	A dummy variable for every firm (id)	Firm effect	Bennedsen & Zeume (2015) and Lim (2011) account for firm effect. Dummy method derive from Chen et al. (2010), Fernández-Rodríguez et al. (2019), Richardson et al. (2016) and Sacristán-Navarro et al. (2011), who use industry effect
	Time-specific effect	A dummy variable for every year	Year effect	Chen et al. (2010), Fernández-Rodríguez et al. (2019), Richardson et al. (2016) and Sacristán-Navarro et al. (2011)
FIRST-DIFFERENCE METHOD	All variables	Change in variables $\Delta \text{var} = var_{it} - var_{it_{-1}}$	ΔVAR	Harvey (1980) and Longhi & Nandi (2019)

4 DATA

In order to address the research question: *What is the effect of ownership structure on tax avoidance of publicly listed mining firms in Indonesia?* we use data on the owners of Indonesia's listed mining companies. Thereby controlling shareholders can be found, which then can be divided into the different types. During this research, it was noticeable that apparently there are no transparent databases regarding companies listed in the IDX, whereas there are platforms for western country based firms in order to obtain ownership information such as Thomson (US market) used by Khan et al. (2017) and AMADEUS (East and West EU market) used by Pindado et al. (2008). In 2020, a database called UBO-register, which entails information on the ultimate owners of firms based in the Netherlands, is provided by the Dutch national government[53].

Thus, no databases were found containing ultimate owners of the listed mining companies in Indonesia. Existing databases that might entail such information require financial contribution in exchange for the access. This was not possible due to limitation in resources and doubt whether they actually provide ultimate owner information after registering. The prior study covering ownership in Indonesia, Masripah et al. (2015), used the Data Center Business Indonesia and the Ministry of Law and Justice database but it seems that these databases are not provided by or cannot be found via the web.

Due to the database limitation, this study relied on public secondary data gathered from the database Orbis, the information given by the Indonesian Stock Exchange (IDX), and from financial statements of the listed Indonesian mining firms provided by their websites. Initially, a dataset was given by the University of Sebelas Maret in Indonesia, which includes the names and numbers of listed mining companies in the IDX. Nevertheless, we filtered some firms after studying the firms and comparing information with the ones from the IDX, Orbis and the financial statements in order to validate the database provided by the UNS. Not all of them are active in the mining sector. In addition, many other listed mining companies were found.

In order to ensure that data obtained from Orbis are reliable, all ownership variables were compared with the data given by the individual annual reports. Unfortunately, for some instances, it occurred that the data from Orbis did not correspond to the data given by the annual reports. In

[53] Rijksoverheid (2020). UBO-register. Retrieved 15 May, 2020 from https://www.rijksoverheid.nl/onderwerpen/financiele-sector/ubo-register

those cases, the information given by the annual reports was used. Annual report information as preferred because in Indonesia firms need to comply to the financial accounting standards (SAK), which are set by the Financial Accounting Standards Board (DSAK IAI) and the Indonesian Sharia Accounting Standards Board (DSAS IAI) (for sharia-based companies) and undergo audits[54]. The DSAK IAI also coincides with the International Financial Reporting Standards (IFRS). In addition, Indonesia's public firms are required to have internal audit committees and internal audit units[55]. But in situations of inconsistency, also web search engines were used as source to compare again. It seems that in general Orbis does not necessarily provide consistent ownership data of firms. This is as well reported by other researchers covering ownership structure (see, e.g., Cuervo-Cazurra, 2018; Ruiter, 2017).

Apparently, even for public firms it is not possible or rather complicated to gather the ultimate owners. One has to follow several levels of the ownership pyramid in order to find information regarding the ultimate owner, which is not possible for most of the firms. Even if ultimate owner was found, one was not able to find any information regarding the ultimate owner in order to categorize it among the ownership types. If all firms, which did not have ultimate owner information were excluded, then the sample size of this research would have been too small to being conducted. Hence, providing comprehensive data regarding direct shareholding and its effect on tax avoidance would be not possible. Similar problems were encountered by recent studies of Utama et al. (2017), who studied corporate governance and ownership structure in Indonesia. They found that more than 70 % of the public companies in Indonesia were largely owned by limited liability corporations whose ultimate owner are not provided. While Utama et al. (2017) were able to gather missing ultimate owner information for domestic corporations from the Ministry of Justice and Human, this study was limited by missing database. Even after accessing more data, Utama et al. (2017) still was missing about 15 % of ultimate owner data.

Next to ownership data, this research also has to access firm's financial data. Also here Orbis, firm's websites and their annual reports were used to obtain the control variables SIZE, DEBT RATIO and ROA as well as the dependent variables ETR, CETR and PBT. Regarding the financial data, Orbis seem to correspond to the data provided by the firms' annual reports.

[54] Medina, F., A. (2020). Audit and Compliance in Indonesia: A Guide for Foreign Investors. Asean Briefing. Retrieved 15 March, 2020 from https://www.aseanbriefing.com/news/audit-compliance-indonesia-guide-foreign-investors/
[55] Medina, F., A. (2020). Audit and Compliance in Indonesia: A Guide for Foreign Investors. Asean Briefing. Retrieved 15 March, 2020 from https://www.aseanbriefing.com/news/audit-compliance-indonesia-guide-foreign-investors/

Nevertheless, some cases the currency had to be converted. Orbis only provides the financial data for a couple of consecutive years. Prior years' data needed to be gathered from the financial reports, which were given in Rupiah and/ or not were always transparent (readable).

In this study, we examine 34 public mining firms in Indonesia. Their participation in the Indonesian Stock Exchange varies starting with the earliest firms having their IPO date in 2004. This sample contains unbalanced firm data ranging from 2004-2018.

5 REGRESSION RESULTS

This chapter provides the results of this thesis's study. First, an outline of robustness checks conducted in this study is provided followed by a univariate analysis, namely the descriptive statistics. Next, a bivariate analysis including the correlation matrix is given. Afterwards, the regression results are presented with a multivariate analysis and undergo the robustness tests.

5.1 Regression Diagnosis

To ensure robust results of this study, this thesis applied various approaches. First of all, several proxies of tax avoidance are used in this study namely PBT, ETR and CETR. Second, in order to avoid biased parameter estimates, this thesis corrects for extreme outliers with the winsorizing method. Following percentiles values are used: PBT at 2%-95%, Size at 2,5%-99%, Debt Ratio at 0,1%-97,5%, ROA at 1,5%-99%. ETR and CETR are winsorized with the values 0 and 1 in order to increase the robustness towards the outliers. Furthermore, due to the inclusion of outliers and the fact of having a small sample size, normal distribution is not likely present (De Veaux, Velleman & Bock, 2005). As confirmed by the Sahpiro-Wilk test results of the tables in Appendix A, the majority of data is not normally distributed.

This study also tested all hypotheses with two proxies. The explanatory factors, specifically the ownership types, are provided as continuous variables (percentages) as well as dummy variables. This way differences in outcomes among the models can be accounted for and hence strengthen the argumentation of the study results.

This study includes panel data and covers up to 15 years for 34 firms. For that time-specific and firm-specific (individual-specific) effects are accounted for during the regression. In case the year and firm dummies have significant effect on the regression results, those dummies are included in the final output. This information is provided in the upcoming regression tables.

After applying the Hausman test to choose between the RE model or FE model the appropriate methods are applied to test for heteroskedasticity. For the FE model the modified Wald test for groupwise heteroskedasticity is applied. For the RE models, this study applied the White Test for Heteroskedasticity (White, 1980). To note here is no general consensus how to test for heteroskedasticity in RE models. Another choice could be the Breusch-Pagan test. Yet, this test

seems to be best-suited for normally distributed data (Waldman, 1983; Wooldridge, 2010), which is not the case in this study (Appendix A). In case the null hypothesis is rejected in the tests, there is evidence for heteroskedastic errors. For those cases, the regression analyses were performed again but this time with robust standard errors, also called Ecker, Huber, and White-estimator in order to correct for heteroskedasticity (Richardson et al., 2016; Wooldridge, 2010).

Noticeable is that in some cases of the RE and FE regression models, the robust standard errors lead to missing Wald Chi-squared and F-test statistics results. Hence, information on whether the regression analysis of the corresponding model is significant or not is missing. This is because with the robust standard errors, the number of parameters are higher or equal to the number of clusters. Not all coefficients can be tested simultaneously. [56] Nevertheless, these tests were also run without robust standard errors, which report the test statistics results. They are significant at the 0.01 level. Furthermore, there are no major differences between the model outcomes. Therefore, the missing power of the test is not an incremental problem and the tests and tables are interpretable, even without the Wald Chi-squared test and F-test p-values. On account of that it is decided to hold on to the versions with robust standard errors in order to correct for heteroskedasticity. The Hausman, White and modified Wald test results are provided in the regression tables.

To check whether independent variables are highly linearly related and correlated, which would cause unreliable and imprecise effects on the dependent variable (Alin, 2010), this study applies the Pearson correlation matrix. The resulting matrix is presented in Table 5. In case there is a high correlation coefficient between the explanatory variables, we can assume multicollinearity (Alin, 2010).

Additionally this study calculates the variance inflation factors (VIF) to check for multicollinearity. Even though there is no evidence of high correlation, the ownership types are significantly correlated with each other. This occurrence might be plausible, since the companies are publicly traded and doe have more than one type of owner. Hence due to the agency conflict aspects, the one owner might influence the likelihood of the other type of owner. Nevertheless, as a robustness test, all regression models are also run with the ownership types individually to test for individual effects.

[56] StataCorp. 2013. Stata Statistical Software: Release 13. College Station, TX: StataCorp LP

5.2 Descriptive Statistics

The variables used in this study and their descriptive statistics are provided in Table 4.
Panel A displays the tax avoidances proxies PBT, ETR and CETR. Panel B displays the ownership types as the independent variables. In this panel, the type of owners are displayed as percentages. The descriptive statistics of the dummy versions of the ownership types are provided in Panel C. Panel D then presents the sample characteristics of the control variables SIZE, DEBT RATIO and the firm's ROA.

The big variations within PBT, SIZE, DEBT RATIO and ROA and can be explained by the fact that some companies are older and bigger than others, hence their numbers are distinctive larger compared to other firms. Regarding the ownership of the firms, it seems that foreign ownership has the highest mean followed by domestic corporation as owners. This means that foreign firms and corporations had the highest amount of ownership in firms, indicating there is a high ownership concentration within the owned firm, since less percentages are left for other controlling owners or the public. The opposite goes for family ownership, which shows low ownership average of only 5,1 % in Panel B as well as state ownership with 7,3% average of ownership. One could argue that apparently if the Indonesian coal mining company is owned by a family/ individual, institutional or the state, it is only controlled at most by up to 8 % by them; meaning the rest of controlled ownership is owned by another type or the public. This finding supports the hypothesized second contribution of the thesis. Prior findings stated that in Indonesia and other emerging countries families or the state are the largest shareholders (Claessens et al., 2000; Claessens & Yurtoglu 2013; Cullinan et al., 2012; Douma et al., 2006; Handayani & Ibrani 2019; Liew 2007). This study shows that this is different with the mining industry. Panel C shows that on average about 62,2% of the Indonesian mining companies in this dataset have foreign owners as controlling owners among the 15 years and only 11,6% have the government as controlling owner. The high percentage of 96,6% of public ownership is plausible since this dataset is based on public companies, hence most firms have public owners as controlling owners. One should note here that as dummy version of ownership types (Panel C) the firm can have several controlling owners in the same accounting year.

Table 4. Descriptive Statistics

Panel A. Tax avoidance measures

Variable	Obs	Mean	Std.Dev.	Min	Max	1st Qu.	3rd Qu.	IQR
PBT	328	84.9	196.3	-407.9	598.8	-1.4	103.5	104.9
ETR	327	.275	.224	0	1	.14	.36	.22
CETR	298	.280	.265	0	1	.06	.39	.33

Panel B.: Ownership types %

Variable	Obs	Mean	Std.Dev.	Min	Max	1st Qu.	3rd Qu.	IQR
%FAM	328	.051	.132	0	.657	0	0	0
%GOV	328	.073	.203	0	.650	0	0	0
%DOMC	328	.189	.274	0	1.00	0	.360	.360
%DOMI	328	.076	.161	0	.890	0	.058	.058
%FOR	328	.209	.253	0	.981	0	.3	.3
%PUB	325	.316	.184	0	.927	.200	.424	.224

Panel C.: Ownership types dummy

Variable	Obs	Mean	Std.Dev.	Min	Max	1st Qu.	3rd Qu.	IQR
FAM	328	.204	.404	0	1	0	0	0
GOV	328	.116	.321	0	1	0	0	0
DOMC	328	.436	.497	0	1	0	1	1
DOMI	328	.281	.450	0	1	0	1	1
FOR	328	.622	.486	0	1	0	1	1
PUB	325	.966	.181	0	1	1	1	0

Panel D.: Firm specific characters / Control variables

Variable	Obs	Mean	Std.Dev.	Min	Max	1st Qu.	3rd Qu.	IQR
Size	326	12.0	2.35	5	15	11	14	3
Debt Ratio	328	.541	.266	.04	1.29	.34	.69	.35
ROA	328	.061	.156	-.38	.52	-.015	.13	.145

5.3 Correlation

The bivariate analysis is conducted with the Pearson correlation matrix. The first correlation matrix Panel A of Table 5 reports all variable correlation coefficients with the ownership types as percentages, whereas Panel B runs them as dummy variables. As one can see there are no high correlations among the variables except for CETR and ETR with about 72,4%. Since both variables incorporate the effective tax rate, a high correlation might be inevitable and should not be a concern. Both variables are still considered as distinguishing tax avoidance measures, since one of them indicates deferral strategies (CETR) and the other not. Noticeable is that in both tables, either dummy variable or continuous variable, domestic corporate ownership seems to be negatively correlated with PBT. Also, GOV shows a different relation than hypothesized. Firms

which are owned by the state seem to report 29,3% higher profits before tax. The significance level for both ownership types are high at 1%. In both models, GOV seems to positively be correlated to SIZE and ROA and negative towards DEBT RATIO indicating state owned firms have better firm performance and are less debt dependent. The opposite holds for firms with domestic institutional owners. As argued in the theory, institutional ownership might rather have short term financial goals in mind leading to rather negative ROA and positive debt ratio in Panel B.

Another interesting result is that all ownership types are negatively correlated with each other, in particular in Panel A. The one owner seems to hinder or decrease the ownership of the other. The reason could be probable agency conflicts regarding the firm's goals and owners' intends as discussed in the theoretical part. Whereas the state, for instance, might have the companies long-term goal in mind and its CSRs towards society, the other owners might prefer personal benefits like short time financial goals. Missions between a government and companies might differ substantially.

The correlation matrix also shows significant correlation between PBT and the other dependent variables. This finding is reasonable since ETR and CETR ratio calculations have profit before tax as denominator. Also their correlation is not strong, hence their correlation is not problematic.

According to Panel B, when considering dummy variables, it seems that foreign ownership is significantly negatively correlated to PBT, ETR and CETR being the only ownership type showing a significant negative relationship with all tax avoidance proxies.

At first sight, both panels indicate that there is no problem of high collinearity, since they do not even achieve 0.5. Hence, one would argue there is no multicollinearity. Nevertheless, in research there is no real threshold for deciding whether the correlation is too high to consider the effect of the independent variable as problematic (Hair et al., 2014). Hair et al. (2014) argues that 0.9 or higher indicate high correlation but they also argue that 0.7 can already be problematic. Minnick and Noga (2019) for instance used 0.5 as threshold in their paper. Deciding for the threshold depends on the researchers interpretation and other factors. For example if the dataset has a small sample size like this study does, unique variance might be weak or non existent even if one independent variable is only partially explained by the other independent variable (Hair et al., 2014). In this study, the significant negative correlation of -34,2% between the ownership types FOR and DOMC in Panel A could still be a sign of multicollinearity. Moreover according to Hair

et al. (2014), if the correlation between these two variables is higher than the correlation between them and the dependent variables individually, the regression result estimations can also be problematic. Indeed this occurs with FOR and DOMC, which individually are not or only to a small degree correlated with the dependent variables as can be gathered from both panels.

In order to be sure about the independence between the independent variables, this study also looks at the variance inflation factors (VIF) to test for multicollinearity as is also done by Badertscher et al. (2013), Bradshaw et al. (2016), Gaaya et al. (2017, Lanis and Richardson (2011), Mafrolla (2019) Minnick and Noga (2010) and Richardson et al. (2016). The VIF tables can be found in the appendances. The threshold for indicating multicollinearity with VIF values is 10 indicating multicollinearity (Hair et al., 2014). Again also here, lower values might also indicate multicollinearity, though it is on the researcher to decide and interpretate the accepted threshold.

This study follows the above mentioned papers and choses the value 10 as threshold to indicate the existence of multicollinearity. As can be gathered from the tables in Appendix B., most of VIF values are smaller then 10, even smaller than 5. Only for the control variable SIZE the values exceed the threshold of 10. Nevertheless this problem is accounted for already since all regression models in this thesis run the tests once with the control variables such as SIZE and once without.

Table 5. Pearson Correlation Matrix

Panel A

	PBT	ETR	CETR	%FAM	%GOV	%DOMC	%DOMI	%FOR	%PUB	Size	Debt Ratio	ROA
PBT	1											
ETR	**0.185*** **	1										
CETR	**0.160*** **	**0.724*** **	1									
%FAM	-0.052	0.025	-0.034	1								
%GOV	**0.293*** **	0.024	0.014	**-0.141** **	1							
%DOMC	**-0.196*** **	-0.018	-0.034	**-0.133** **	**-0.240*** **	1						
%DOMI	0.014	-0.004	0.031	**-0.125** **	**-0.171*** **	**-0.249*** **	1					
%FOR	-0.044	-0.046	-0.048	**-0.165*** **	**-0.284*** **	**-0.342*** **	**-0.179*** **	1				
%PUB	0.092*	0.093*	0.093	**-0.222*** **	0.060	**-0.300*** **	0.075	**-0.280*** **	1			
Size	**0.481*** **	**0.246*** **	**0.196*** **	**-0.037**	**0.297*** **	-0.102*	0.030	-0.060	0.028	1		
Debt Ratio	**-0.277*** **	0.004	0.060	0.0646	**-0.210*** **	-0.068	**0.246*** **	**-0.182*** **	**0.295*** **	-0.075	1	
ROA	**0.633*** **	**0.189*** **	**0.150*** **	0.0289	**0.259*** **	-0.022	**-0.156*** **	0.065	**-0.120** **	**0.448*** **	**-0.401*** **	1

Panel B

	PBT	ETR	CETR	FAM	GOV	DOMC	DOMI	FOR	PUB	Size	Debt Ratio	ROA
PBT	1											
ETR	**0.185*** **	1										
CETR	**0.160** **	**0.724*** **	1									
FAM	0.044	0.086	0.069	1								
GOV	**0.310*** **	0.020	0.011	**-0.183*** **	1							
DOMC	**-0.209*** **	0.003	-0.028	-0.034	**-0.241*** **	1						
DOMI	-0.074	-0.071	-0.009	-0.013	**-0.226*** **	**-0.166*** **	1					
FOR	**-0.232*** **	**-0.097***	**-0.130** **	**-0.120** **	**-0.386*** **	**-0.126** **	0.025	1				
PUB	0.002	0.083	**0.113***	**-0.157*** **	0.068	0.0631	**0.118** **	-0.042	1			
Size	**0.481*** **	**0.246*** **	**0.196*** **	-0.027	**0.302*** **	**-0.117***	**-0.080**	**-0.228*** **	-0.019	1		
Debt Ratio	**-0.277*** **	0.004	0.060	0.108*	**-0.206*** **	0.017	**0.307*** **	0.018	-0.033	-0.075	1	
ROA	**0.633*** **	**0.189*** **	**0.150*** **	-0.044	**0.260*** **	-0.009	**-0.179*** **	-0.071	-0.024	**0.448*** **	**-0.401*** **	1

Notes: This table reports the Pearson Correlation coefficients with their statistical significance. Panel A reports the ownership types as percentages, whereas Panel B reports them as dummy variables. Bold values are significant at the levels 10% (denoted by*), 5% (denoted by **) and 1% (denoted by ***).

5.4 Results

In this part, the regression results are provided and discussed. To note is that in each Table 4 models are provided. The first and second model (to which we refer as Model 1 and 2, respectively) run the regression with the continuous variable versions of ownership types of which only Model 1 incorporates the control variables SIZE, DEBT RATIO and ROA. Each model also runs the tests with the ownership types individually as a sake of robustness.

$$1st\ Model: Tax\ Avoidance_{it} = \beta_0 + \beta_1 percFAM_{it} + \beta_2 percGOV_{it} + \beta_3 percDOMC_{it} + \beta_4 percDOMI_{it} + \beta_5 percFOR_{it} + \beta_6 percPUB_{it} + \beta_7 Size_{it} + \beta_8 LEV_{it} + \beta_9 ROA_{it} + \mu_i + \lambda_t + \nu_{it}$$

$$2nd\ Model: Tax\ Avoidance_{it} = \beta_0 + \beta_1 percFAM_{it} + \beta_2 percGOV_{it} + \beta_3 percDOMC_{it} + \beta_4 percDOMI_{it} + \beta_5 percFOR_{it} + \beta_6 percPUB_{it} + \mu_i + \lambda_t + \nu_{it}$$

The third and fourth model (Model 3 and 4, respectively) provide the results of the dummy variable versions of ownership type's effect on the dependent variable of which only Model 3 includes SIZE, DEBT RATIO and ROA. Also here the models include ownership types individual effects on the dependent variable.

$$3rd\ Model: Tax\ Avoidance_{it} = \beta_0 + \beta_1 dummyFAM_{it} + \beta_2 dummyGOV_{it} + \beta_3 dummyDOMC_{it} + \beta_4 dummyDOMI_{it} + \beta_5 dummyFOR_{it} + \beta_6 dummyPUB_{it} + \beta_7 Size_{it} + \beta_8 LEV_{it} + \beta_9 ROA_{it} + \mu_i + \lambda_t + \nu_{it}$$

$$4rth\ Model: Tax\ Avoidance_{it} = \beta_0 + \beta_1 dummyFAM_{it} + \beta_2 dummyGOV_{it} + \beta_3 dummyDOMC_{it} + \beta_4 dummyDOMI_{it} + \beta_5 dummyFOR_{it} + \beta_6 dummyPUB_{it} + \mu_i + \lambda_t + \nu_{it}$$

During analysis especially the results of CETR how some noteworthy findings. This is why in the main part of the regression analysis the tables reporting results of CETR are provided, whereas the results of ETR and PBT are reported in the Appendix C. All regression tables are separated into Panel A and B. Panel A runs the tests with the ownership types as percentages, whereas Panel B runs them as dummy variables. All tables also include the results of the Hausman

test, Modified Wald test, White test as well as the results of the distribution tests depending on the application of random-effects model (F-test) or random-effects model (Wald Chi2 test).

As can be gathered from the tables, mostly RE is suggested by the Hausman test. Furthermore, after applying the two-way error component model the significance of the individual-specific effect and time-specific effect were tested. In all models, the individual-specific estimator is included. Since in a fixed-effects model the individual-specific fixed effect is already incorporated, an addition of the estimator would drop out (Longhi & Nandi, 2019). In those cases, the effects are not again added to the regression.

As can be gathered from the regression tables, only in the case of PBT does the time-specific effect significantly affect the results. In the case of CETR and ETR, this data set did not show any indication of a trend among the years 2004-2018.

The fixed-effects/ random-effects regression results are followed by the first-difference regression results, which is based on the OLS method. Also here robust standard errors were applied, in case the White test indicates significant results. Both the prior regression results and the first-difference results are reported neatly in Table 10, which only includes the significant results. Now, the comparison between the results is simplified.

5.4.1 Regression Results of Family Ownerships Effect on Tax Avoidance

In Table 6 Family ownership seems to significantly affect CETR positively as dummy variable (Panel B) in both Models 3 and 4, with or without control variables. FAM leads to an ETR increase between 7,5 % and 9,3 %. FEM's effect on CETR is not significant if all the other owners are accounted for. In Table C1 (Appendix) one can see that family ownership as percentage leads to higher ETR, if control variables and other owners are accounted for (Panel A Model 1). With a significance level of 0.05, firms owned by family/ individual generate on average 46% higher ETRs if the firm is also owned by other type of owners.

Nevertheless no significant effect is reported if FAMs impact is tested individually regarding ETR.

Regarding PBT, family ownership seems to not have any significant effect. According to this study results family ownership does not lead to lower PBT, nor does it necessarily lead to higher PBT. According to the findings, H1 has to be rejected. Family ownership in Indonesian mining firms does not have a positive effect on tax avoidance. Results were either insignificant or positively significant, hence FAM would rather not lead to tax avoidance. The results support the

findings of Chen et al. (2010), Richardson et al. (2016) and Landry et al. (2013). Family owners seem to rather not want to harm their reputation and fear penalties that can be caused by tax avoidance tactics.

5.4.2 Regression Results of State Ownerships Effect on Tax Avoidance

The results of state ownership on tax avoidance show that GOV does not have any significant effect on any of the tax avoidance proxies. There is not enough significant evidence to support H2. Although in the case of CETR and ETR, individually GOV seems to indicate a negative direction and as a dummy variable this holds also when the firm is owned by other owners as well (Table 6 Panel B & Table C1 Panel B). Also the effect on PBT is negative in all models if the firm is co-owned by others. Whereas H2 is not supported, one could argue that state ownership does not necessary lead to less tax avoidance as well. This does not support the conventional view, which points out that the state should protect and maximize social welfare and also ensure good firm performance (Shleifer and Vishny, 1994).

Furthermore, the insignificant findings are valuable and interesting, since prior findings did in fact find significant influence of state ownership on tax avoidance. Hence insignificant findings could as well shed a light on the aspects of state's role on tax avoidance.

The findings of this study, which indicate that the state as owner does not play any significant role regarding tax avoidance contradicts Chan et al. (2013), Jian et al. (2012) and Fernández-Rodríguez et al. (2019) who all found that state ownership leads to less tax avoidance. The assumption is that the firm's manager would rather ensure state revenue to satisfy the state as owner. This study's results are however similar to the findings of Mafrolla (2019), who as well did find insignificant but negative relationship between state ownership and tax avoidance.

5.4.3 Regression Results of Domestic Corporate Ownerships Effect on Tax Avoidance

The regression tables 6 and C1 report strong evidence of a positive effect of domestic corporate ownership on CETR and ETR. In both cases DOMC significantly leads to higher CETR and ETR as percentage and sole owner. Regarding the effect on CETR, DOMC as a dummy, individually leads to about 15% higher CETR with or without control variables (at the significance level of 0.05). Similar power is reported in the case if ETR. There DOMC leads to between 12,9 % and 13,4 % higher ETR individually either with or without control variables (significance level 0.1 and

0.05). DOMC also significantly affects ETR positively if the regression includes all other owners for both Models 1 and 2. When other owners are also accounted for, DOMC leads to about 33,1 % - 35,2% higher ETR (significance level 0.10).
Regarding PBT, DOMC does not show any significant effect.

The findings on CETR and ETR support H3 and add to the findings of Douma et al. (2006) and Mishra (2013), who state that domestic corporate owners rather seek to acquire other firms or be acquired, hence the do not seek private benefits, which would be tax avoidance in this case. They rather pay attention towards better monitoring and long-term value. Also since they have lower resource capacity (Douma et al., 2006), tax avoidance tactics would be too costly to be considered.

5.4.4 Regression Results of Domestic Institutional Ownerships Effect on Tax Avoidance

DOMI does significantly lead to lower CETR (Table 6 Panel B Model 3) and ETR (Table C1 Panel B Model 3 & 4) as a dummy variable. In both cases CETR and ETR, DOMI negativeley affects the dependent variables either as sole owner or co-owner.
The negative effect on ETR remains even with or without control variables. The significant levels are at the 0.01 and 0.05, hence there is strong evidence of the negative effect.
DOMI does not affect PBT significantly.

All in all, most results support H4. Firms owned by domestic institutions have on average 14,8% to 17,8% lower ETR and 15,6% to 18,9% lower CETR. Hence, domestic institutional ownershop in Indonesian mining companies leads to teax avodiance.

These findings comply with the findings of Bayar et al. (2018) and Huseynov and Klamm (2012). According to Bayar et al. (2018) the effect is stronger for firms with good governance. Reason for the positive effect on tax avoidance could lie on the ability and resources to manage taxes well, which also leads to less financial distress. Meaning tax avoidance by them would not necessarily harm the firm value. But considering the results and argumentation of others, they probably do not have the firm value in mind when avoiding taxes. This is also supported by the correlation matrix in Table 5, in which one can see that DEBT RATIO is positively correlated with DOMI, whereas ROA is negatively correlated with DOMI.

Furthermore the study results support Douma et al. (2006), who found that DOMI in transition economies do not have solely the firm value and performance in mind and do not affect

the firm performance significantly positively. Also Giannetti and Laeven (2009) are supported stating that domestic institutional ownership do not contribute towards firm value. Besides, the results also fit the argumentation of Aggarwal (2017), who states that institutional owners in civil law countries do not necessarily improve firm's governance and are probable biased towards the firm's management. Hence firm performance and governance are not priority for domestic institutional owners. It seems domestic institutional owners indeed rather prefer short term goals, in this case tax avoidance tactics and by this risk the firm reputation.

5.4.5 Regression Results of Foreign Ownerships Effect on Tax Avoidance

When separated from the other ownership types, FOR as percentage and without control variables, significantly affect CETR negatively (Table 6 Panel A Model 2). In Panel B however, the significant negative effect of FOR on CETR holds either with or without control variables and co-owners. If the firm is owned or co-owned by foreign ownership, CETR is reduced by about 14,0% to 16,7%. There is no significant effect on ETR. However FOR seems to lead to less PBT in Table C2 Panel B Model 3 and 4 (significant at level 0.01 and 0.05).
On average foreign ownership leads to a decrease of about $78.5 - $92.3 million (USD) compared to the other firms.

Overall, the findings support H5 indicating that foreign ownership in Indonesian mining companies leads to tax avoidance. The study results correspond to the findings of Annuar et al. (2014), Demirgüç-Kunt and Huizinga (2001) and Van Gelder et al. (2016). The fact that foreign holders not only decrease CETR, hence lead to tax avoidance, but also lead to lower PBT sheds a new light in the findings of foreign ownership on the firm's value and performance. Love et al. (2009) and Douma et al. (2006) found that foreign ownership led to firm performance. This seems to not be the case for Indonesian mining companies, since lower profit before taxes means that the firm probably does not perform well. Also Dahlquist and Robertsson (2001) found similar results stating foreign ownership did not significantly affect firm's ROA and beta (also supported by Table 5). The reason could be that foreign investors often seem to be foreign institutional owners (Dahlquist and Robertsson, 2001), which also supports the studys results on institutional ownership and its positive effect on tax avoidance.

5.4.6 Regression Results of Public Ownerships Effect on Tax Avoidance

As explained earlier, public ownership's effect is not focus of this studys research, hence no relationship between this type and tax avoidance is hypothesized and investigated. Nevertheless, the inclusion of public ownership provides interesting results. The regression results show that all dependent variables PBT, ETR and CETR are significant and positively affected by PUB as can be seen in Table 6 (Panel B Model 3 & 4), Table C1 (Panel A Model 2) and Table C2 (Panel B Model 2). It does so also as sole owner in the case of CETR and PBT.

The results of PUB indicate that if firms would allocate more shares to the public (to minority shareholders with less or equal to 5% shares) tax avoidance would probably not occur. The results show that the variable public ownership might be a critical and contributable aspect for further research regarding the studies of ownership structures.

5.4.7 Regression Results of Control Variables Effect on Tax Avoidance

SIZE does not have any significant effect on CETR. It does however affect ETR significantly positive but only if the firm is owned by domestic corporation. Also, in Table C3 Model 1 and 3, SIZE significantly leads to higher PBT. Whereas Shevlin and Porter (1992) argue that larger firms are capable to apply good tax planning methods due to their resources (cited by Chan et al. (2013), the results show that they would not necessarily do so, otherwise SIZE would affect PBT negatively here. Also, the fact that there is no significant negative effect on CETR and in most cases not on ETR, indicates that larger firms might avoid reputational damages caused by tax avoidance (Chan et al., 2013). Nevertheless, it seems that results regarding firm's size on firm's effective tax rates are mixed and weak as also argued by Dyreng et al. (2008).

Debt Ratio affects CETR positive at the significance levels 0.01 and 0.05 (Table 6 Model 1 & 3). Regarding ETR there seems to be no significant effect of DEBT RATIO. The reason for the positive effect on CETR could be the tax deduction benefit of debt. The results supports the findings of Lim (2011) and Graham and Tucker (2006). Firms who avoid taxes do not need to issue more debt for tax deductions, hence the higher the debt ratio, the lower the probability that these firms additionally adopt tax avoidance practices. By this CETR is not decreased by the debt ratio.

DEBT RATIO significantly affects PBT negatively at the 0.05 level (C3 Model 1 & 3). The negative effect on PBT is probable due to the fact that PBT includes interest expenses, hence

the more debt, the higher the interest expenses and lower the PBT. Another explanation could be that firms with high debt ratios, hence financial distress, are in such a situation because there is not enough internal generated funds. This means firm performance and sales are weak and by this profits are low. Such firms would have to rely on other funding options such as debts. One theory explaining that effect is the Pecking Order Theory, which states that a firm prefers to first use internal generated funds instead of debt. Issuing equity would be the last choice for financing (Myers & Majluf, 1984).

ROA seems to have a significant positive relationship towards CETR and ETR. As argued before, the reason could be that firms with high ROAs, would rather not want to harm their good performance and reputation with avoiding taxes by lowering PBT. The results of ROA on ETR partially contradict the results of Huseynov & Klamm (2012), who found a negative relation between ROA and ETR. Though it supports their findings on ROAs positive affect on CETR. Also the finding of Chan et al. (2013) are supported.

Table 6. Regression results CETR
Regression of CETR is estimated using a random-effects or fixed-effects model

CETR

Panel A. Ownership types as percentage

		Model 1							Model 2						
	Pred. Sign	All	FAM	GOV	DOMC	DOMI	FOR	PUB	All	FAM	GOV	DOMC	DOMI	FOR	PUB
		RE	RE	RE	FE	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE
FAM	-	.327 (0.93)	.147 (1.53)						.036 (0.11)	.030 (0.34)					
GOV	-	.179 (0.52)		-.062 (-0.67)					-.009 (-0.02)		-.059 (-0.78)				
DOMC	+	.239 (0.69)			.149** (2.22)				.047 (0.14)			.144** (2.00)			
DOMI	-	-.204 - 0.35)				-.074 (-0.22)			-.361 (-0.62)				-.019 (-0.05)		
FOR	-	-.191 (-0.37)					-.195 (-1.49)		-.399 (-0.76)					-.251* (-1.69)	
PUB	.	.038 (0.12)						.046 (0.21)	.037 (0.11)						.138 (0.60)
Size		-.003 (-0.17)	-.005 (-0.29)	-.006 (-0.31)	-.005 (-0.28)	-.006 (-0.30)	-.004 (-0.20)	-.006 (-0.35)							
Debt Ratio		.276** (2.54)	.255*** (2.69)	.248*** (2.68)	.261*** (3.08)	.258*** (2.69)	.228** (2.55)	.244** (2.41)							
ROA		.388** (1.95)	.408** (2.14)	.399** (2.15)	.389** (2.22)	.396** (2.11)	.376** (2.06)	.397** (2.12)							
Constant		.225 (0.46)	.147 (0.59)	.159 (0.63)	.145 (0.69)	.165 (0.63)	.253 (1.03)	.166 (0.65)	.570 (1.19)	.275*** (0.00)	.275*** (0.00)	.260*** (34.54)	.279*** (3.32)	.413*** (5.05)	.260*** (10.07)

Firm effect	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	
Year effect	no	no	no	no	no	no	no	no	no	no	no	no	no	no	
Hausman test (p-value)	0.06	0.12	0.08	0.03	0.13	0.05	0.09	0.34	0.77	0.68	0.06	0.72	0.11	0.99	
Modified Wald test (p-value)				0.00											
White test (p-value)	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
F-Test (p-value)				3.26** (0.02)											
Chi-2-Test (p-value)	.	.	.		.	.	.	.	.	.	.		.		
Adjusted R2	.135	0.133	0.133	.038	0.133	0.140	0.128	.109	0.105	0.105	0.112	0.105	0.118	0.103	
N	295	297	297	297	297	297	295	296	298	298	298	298	298	296	

Panel B. Ownership types as dummy

		Model 3							Model 4						
	Pred. Sign	All	FAM	GOV	DOMC	DOMI	FOR	PUB	All	FAM	GOV	DOMC	DOMI	FOR	PUB
		RE	RE	RE	RE	FE	RE	FE	RE	RE	RE	RE	FE	RE	RE
FAM	-	.037 (1.20)	.093*** (2.73)						.028 (0.78)	.075* (1.93)					
GOV	-	-.026 (-0.33)		-.042 (-0.71)					-.014 (-0.19)		-.039 (-0.83)				
DOMC	+	.001 (0.01)			.044 (0.76)				.017 (0.23)			.057 (0.96)			

DOMI	-	-.189** (-2.08)				-.156* (-1.74)			-.165 (-1.61)				-.134 (-1.34)		
FOR	-	-.167** (-2.42)					-.143* (-1.85)		-.153* (-1.93)					-.140* (-1.71)	
PUB	+	.150** (2.56)						.062** (2.61)	.166* (1.73)						.077 (1.19)
Size		-.011 (-0.64)	-.004 (-0.25)	-.006 (-0.31)	-.004 (-0.24)	-.006 (-0.37)	-.008 (-0.46)	-.006 (-0.37)							
Debt Ratio		.286*** (3.32)	.261*** (2.68)	.248*** (2.68)	.254*** (2.85)	.295*** (3.21)	.251*** (2.87)	.241*** (2.77)							
ROA		.384** (2.30)	.408** (2.19)	.399** (2.15)	.377* (1.94)	.383** (2.21)	.385** (2.20)	.402** (2.28)							
Constant		.242 (1.06)	.130 (0.53)	.159 (0.63)	.092 (0.34)	.217 (1.05)	.329 (1.30)	.144 (0.69)	.410*** (2.91)	.275*** (0.00)	.275*** (0.00)	.218*** (3.68)	.319*** (11.18)	.415*** (5.08)	.198*** (3.04)
Firm effect		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes		yes
Year effect		no	no	no	no	no	no	no	no	no	no	no	no		no
Hausman test (p-value)		0.00	0.08	0.08	0.08	0.01	0.06	0.05	0.15	0.70	0.68	0.11	0.04	0.25	0.38
Modified Wald test (p-value)		0.00				0.00		0.00					0.00		
White's test (p-value)		0	0.00	0.00	0.00		0.00		0.00	0.00	0.00	0.00		0.00	0.00
F-Test (p-value)		4.74*** (0.00)				3.83** (0.01)		5.60*** (0.00)					1.80 (0.19)		
Chi-2-Test (p-value)			.	.	.		.		.	.	.	.		.	.
Adjusted R2		0.161	0.138	0.133	0.135	0.051	0.150	.030	0.127	0.109	0.105	0.110	0.013	0.122	0.102

N	295	297	297	297	297	297	295	296	298	298	298	298	298	296

Notes: This table reports regression results for the dependent variable CETR as proxy for tax avoidance. A panel data model is applied for the regressions and those are estimated with annual data for the period of 2004–2018. In Panel A, the tests are run with the ownership types as percentage, whereas in Panel B they are run as dummy variable. Model 1 and 3 include the control variables, which are excluded in Model 2 and 4. Depending on the Hausman test results the F-statistic is shown for the fixed-effects model and Wald Chi-2-Test statistics for the random-effects model. In case the Modified Wald test for FE model or White's test for RE model indicate significant results, the regression is run with robust standard errors to fix for heteroscedasticity. Individual-specific dummies are included in all models as they showed significant effect on the regression results. Time-specific dummies did not show any significant effect on the regression outcomes, thus they are not included in any model.
The results of the T-statistics as well as the p-value of the F-Test and Wald Chi-2-Test are shown in parentheses. In this analysis, the addition of robust standard errors leads to missing Wald Chi-2-Tests and in some cases to missing F-Tests. An explanation is given in Regression Diagnosis. See Table 3 for variable definitions.
* Statistical significance at 10% level.
** Statistical significance at 5% level.
*** Statistical significance at 1% level.

5.4.8 Regression Analysis with First-Difference

Table 7 provides an overview of the first-difference regression analysis of CETR showing solely the significant results. The complete tables are reported in Appendix D. Also the overview of the results on ETR and PBT can be found in Appendix E.

Table 7 starts with the interesting findings on the effect of a changing FAM on shifts in CETR and ETR over the consecutive years. As one can see, family ownership as dummy variable (Model 3 & 4) has a significant positive effect on CETR with the two-way error component model as well as the first-difference method. Average changes in FAM as dummy variable and sole owner, leads to about 24.9%-2.79% higher ETR, with or without control variables. Regarding ETR, FAM ownership affects ETR as percentage and co-owner in Model 1 and 2 of the first-difference regression table. Model 1 shows the same significant effect in both regression methods (significance level 0.05).

No significant results regarding FAM and PBT are found. This supports the earlier findings regarding FAM and PBT. All in all, FAM significantly affects changes in firm's CETR and ETR positively over the years. All other results remain non-significant regarding FAM. The addition of the first-difference supports the conclusion that H1 has to be rejected. Rather family ownership leads to less tax avoidance.

A highly interesting result is that of GOV and tax avoidance in this model. Whereas with the two-way error component model no significant effect was found regarding GOV and any tax avoidance proxy, the first-difference method reports that ΔGOV leads to higher ΔCETR and ΔETR and lower ΔPBT. And

Table 7 Model 1 shows that with an increase in GOV (as continuous variable) between the consecutive years, CETR is expected to increase by 87% . The same direction is true in the case of ETR, which increases by 72,9% – 87,8% (Table E1). In both cases GOV does so as sole owner. It seems, that ΔGOV lead to lower PBT as reported in Table E2 (Model 1, 3 & 4). As sole as well as co-oner, state ownership seems to decrease PBT.

Nevertheless, with the strong evidence on both tax avoidance proxies CETR and ETR, one can conclude that the effect of changes in state ownership on changes on tax avoidance contradict H2. Rather the traditional view of state ownerships role is supported.

ΔDOMC effects on ΔPBT are the same as earlier results indicated (E2). No significant effect is reported. Nevertheless, when accounting for the effect of ΔDOMC in ΔETR and ΔCETR

(Table 7 and E1) the results are significant and positive. In Table 7 one can see that additionally, changes in DOMC as dummy variable significantly lead to higher ETR. When controlling for ΔSIZE, ΔDEBT ΔRATIO and ΔROA, ΔDOMC as sole owner, leads to a CETR increase of 38,6% (significance level 0.05) and as co-owner to an ETR increase of 81,3% (significance level 0.01). With this results, H3 is not rejected. In this database, DOMC does not lead to tax avoidance.

The first-difference method did not report significant effects of ΔDOMI on ΔCETR. It does however strongly support the earlier results of DOMI and ETR. As can be gathered from Table E1, on average ΔDOMI leads to negative changes in ETR with the significance levels 0.01 and 0.05 in Model 3 and 4, hence as dummy variables. Meaning that a change from 0 to 1 domestic institutional owner leads to a decrease in ETR by e.g. 15,3% (Model 3) after controlling for ΔSIZE, ΔDEBT ΔRATIO and ΔROA. DOMI still does not significantly affect PBT in any case. The results support H4, meaning DOMI leads to tax avoidance.

All results of the two-way error component analysis regarding FOR and the dependent variables are supported by the FD method. In all cases FOR significantly leads to lower CETR, ETR and PBT, hence to tax avoidance most of the time at the significance level 0.01. This means, there is a strong evidence that FOR leads to tax avoidance as hypothesized (H5). For instance, as shown in Table 7 Model 3, ΔFOR as dummy variable and sole owner, leads to 34,1% % decrease in ETR, after controlling for SIZE, DEBT RATIO and ROA. Regarding ETR, ΔFOR as sole owner and dummy variable, leads to an increase in ΔETR of 15,3% (Table E1 Model 3). Moreover as Table E2 Model 4 report, a change from 0 to 1 FOR decreases PBT by $78.5 million (USD) when accounting for the control variables.

The FD method reports no significant results on PUB and the dependent variables, except for ΔETR.

To sum it up, the first-difference method results mostly confirm earlier regression findings. The first-difference method did not provide results indicating the opposite direction of prior reported relationships. In the case of ΔDOMI effect on ΔCETR and ΔPUB on ΔCETR and ΔPBT, it showed no significant effect, which were significant in earlier regression results. But mostly, the FD method supported the two-way error component regression results. Additionally it did provide new and interesting findings on the role of family ownership and state ownership in this study. Whereas earlier no significant results have been found on GOV regarding ETR and CETR and PBT, when accounting for the effect of changes one can find significant positive effects on CETR

and ETR and negative effect on PBT. FAMs positive effect on ETR is also strengthened by the first-difference method. An overview of the hypothesized and actual effects of both equation methods are reported in Table 8.

Table 7. Comparison between RE/ FE regression method with first-difference method on CETR (only significant results reported)

CETR																	
Panel. A										Panel B.							
		Model 1				Model 2				Model 3				Model 4			
	Pred. Sign	RE/ FE		FD		RE/ FE		FD		RE/ FE		FD		RE/ FE		FD	
		ALL	IND	ALL	IND	ALL	IND	ALL	IND	ALL	IND	ALL	IND	ALL	IND	ALL	IND
FAM	-	.	.	.	.	.	.	.	.	.	.093*** (2.73)	.	.249** (2.07)	.	.075* (1.93)	.	.279** (2.31)
GOV	-	.	.	870** (1.98)	.	.	.	.	.	.	.	.		.	.	.	.
DOMC	+	.	.149** (2.22)	.875** (2.43)	.386** (2.26)	.	.144** (2.00)	.632* (1.78)	.367** (2.15)	.	.	.	.134* (1.71)	.	.	.	.142* (1.86)
DOMI	-	.	.	.	.	.	.	.	.	-.189** (-2.08)	-.156* (-1.74)	.	.	.	.	.	.
FOR	-	.	.	.		.	-.251* (-1.69)		-.440** (-2.14)	-.167** (-2.42)	-.143* (-1.85)	-.321*** (-3.36)	-.341*** (-3.93)	-.153* (-1.93)	-.140* (-1.71)	-.324*** (-3.45)	-.343*** (-4.12)
PUB	.	.	.	.	.	.	.	.	.	.150** (2.56)	.062** (2.61)	.	.	.	.	.	.

Notes: This table reports only the significant regression results of the two-way error component and the first-difference methods for the dependent variable CETR as proxy for tax avoidance. A panel data model is applied for the regressions and those are estimated with annual data for the period of 2004–2018. In Panel A, the tests are run with the ownership types as percentage, whereas in Panel B they are run as dummy variable. Model 1 and 3 include the control variables, which are excluded in Model 2 and 4. RE/ FE stands for the two-way error component analysis, whereas FD represents the first-difference method. ALL stands for the regression models, which include all ownership types. IND represents sole ownership.

* Statistical significance at 10% level.

** Statistical significance at 5% level.

*** Statistical significance at 1% level.

Table 8. Overview of the two equation models and the hypothesized direction

	Two-way error component model with RE/ FE						**First-Difference**					
	CETR		ETR		PBT		CETR		ETR		PBT	
	Predicted effect	Actual effect	Predicted effect	Actual effect	Predicted effect	Actual effect	Predicted effect	Actual effect	Predicted effect	Actual effect	Predicted effect	Actual effect
FAM	-	+	-	+	-	/	-	+	-	+	-	/
GOV	-	/	-	/	-	/	-	+	-	+	-	-
DOMC	+	+	+	+	+	/	+	+	+	+	+	/
DOMI	-	-	-	-	-	/	-	/	-	-	-	/
FOR	-	-	-	-	-	-	-	-	-	-	-	-
PUB	/	+	/	+	/	+	/	/	/	+	/	/

6 Conclusion

6.1 Conclusion and Discussion

On the one hand, there are the sicnere people, who pay taxes accordingly and face the costs. On the other hand, there are companies, who act as economic free riders. They enjoy the societal privileges and society without the responsibility and costs of contributing with tax payment. Such corporations apply tax avoidance techniques in order to decrease tax payments, hence not fully meet their tax duties. This behaviour particularly affects developing countries like Indonesia and causes illicit financial flows, leading to state revenue gaps. Here starts a circle: gaps in state revenue lead to less funds for health care, education, poverty, environmental issues and development. With these gaps, host countries are in need of financial support - typically provided by other countries. Hence, illicit financial flows lead to the event that individual tax payers of the one country actually also pay for the gaps in the country in which the tax avoiding company is located.

Whereas the traditional view of tax avoidance implies that it leads to shareholder value, aspects of the agency theory and the damage it can cause, as mentioned earlier, imply another direction. The agency theory states that conflicts between firm parties such as managers and shareholders or minority and majority shareholders, can arise if the intends are different. The one uses its influence above the other and exploits it for selfish goals. Hence different kind of identities and diversions of shareholding power can cause conflicts and unrightful decisions. Here is where this study draws the link between the firm parties and the effect on tax avoidance. Specifically, the focus lies on ownership type, which is based on ownership concentration and identity, and its effects on firm's decision making, in this case tax avoidance. Namely tax avoidance practices do not happen without the knowledge of controlling owners, since those due to their majority of shares, have decision making privileges. To tackle and research the issue of the roll of the firm's ownership type on tax avoidance, this thesis studies public Indonesian mining companies between 2004 and 2018.

Indonesian mining companies are a valuable unit of study. The mining industry contributes to a large extend to state revenue, countries GDP, exports, employment and development of remote areas. Nevertheless, the industry seems to experience tax crimes that account for 10.5% of the total

illicit financial flows, whereas its contribution to makes Indonesia to one of the top coal exporters globally should rather strengthen its contribution towards the country. Tax avoidance is measured with the proxies profit before tax (PBT), effective tax rate (ETR) and cash effective tax rate (CETR). The independent variables are the ownership types family (FAM), state (GOV), domestic corporations (DOMC), domestic institutions (DOMI), foreign (FOR) and public (PUB). Control variables are size, debt ratio and return on assets. After reviewing prior literature regarding ownership structure and/ or tax avoidance, this paper draws the following hypothesises. H1 and H2 state that family and state ownership, respectively, of Indonesian mining firms have a positive effect on tax avoidance. H3 assumes a negative effect between domestic corporate ownership of Indonesian mining companies and tax avoidance, whereas H4 and H5 (domestic institutional and foreign ownership) assume a positive effect. No hypothesis is given for public ownership. The inclusion of this type is merely for the purpose of data completion, since the firms are trading the in the IDX stock exchange and public ownership also accounts for at least 5% (controlling owner) in 96,6% of the cases. Nevertheless, regression results indicate that public ownership leads to higher PBT, ETR and CETR, meaning a negative effect on tax avoidance.

To test the thesis's hypotheses, this study applied the two-way error component model: with either the fixed-effects or random-effects model (depending on the Hausman test result) and the first-difference method, which accounts for the changes in the dependent variable by changes in the independent variables.

The regression results show that firm's ownership structure has an effect on tax avoidance. As hypothesized, domestic institutional and foreign ownership (H4 and H5) do lead to tax avoidance, as supported by the results of both methods, the two-way error component model and the first-difference model. Also, the results of domestic corporate ownership support the hypothesized direction (H3). Both regression methods report a significant positive relationship between DOMC and ETR. That said, domestic corporate ownership is negatively associated with tax avoidance. Nevertheless, the other two hypotheses H1 and H2 have to be rejected. Whereas the study's assumption was that family and state ownership lead to tax avoidance, the regression results report a significant positive relationship between these two variables and CETR and ETR . Namely, FAM seems to lead to higher CETR and ETR as reported in both regression models, whereas GOV leads to higher ETR and CETR as reported in the first-difference model. This indicates less tax avoidance by these type of owners.

When applying the first-difference method, results show either the same direction (sometimes with stronger significance) or provide new information. In no case opposite directions are reported.

Regarding H1, it seems that prior research was discordant in their results. This thesis's results of family ownership on tax avoidance supports prior findings, which indicated a negative effect. The results of H2 in this thesis contradict the views of prior findings and rather supports the conventional view, which states that state owners enact on their responsibilities and rather want to maximize social welfare and ensure fair prices (Shleifer and Vishny, 1994). It seems that the state also enacts on its responsibilities in developing countries with weak corporate governance. Nevertheless state seems to lead to less profit before taxes to some degree, hence more research on the role of the state as owner might be useful to gain a clearer direction.

As explained earlier, not much was found on the role of domestic corporate and institutional ownership on tax avoidance. Nevertheless, as this study's results have shown, the approach to rely on research papers investigating the role of domestic corporate owners on other firm factors like performance was helpful and the hypothesises of these two owners are not rejected. This and the few prior theses, which included these owners during their ownership structure studies, exhibit a relevant and significant research area.

In conclusion, the research question can be successfully answered. All types of owners investigated in this study, have either a positive or negative effect on tax avoidance.

This thesis provides contributable insights into the study of ownership structure in general and its link to tax avoidance, in particular for emerging markets. Clearly the type of owners of Indonesian mining companies play a relevant role regarding the countries illicit financial flows and gaps in state revenue. As mentioned before, the mining industry in Indonesia would contribute even much more to the countries development and state revenue, if it would not be exploited by specific type of owners and other insiders. Clearly, the money generated by the firm is not allocated rightfully. Instead of losing state revenue due to tax avoidance, the money could be used to decrease poverty and improve the environment. For instance the country would be able to invest in the health care, education and technology regarding the refineries or more sustainable methods of energy production. As long as selfish owners control the companies and receive their steady benefits by the current firm operations and regulation systems, no change is within site. This and similar studies should act as helpful and valuable tools for increasing awareness regarding such

practices and their determinants. Also tax authorities can include such findings for further adjustments.

6.2 Limitation and Further Research

As the results show, this study was able to identify a relationship between ownership types and tax avoidance and by this can contribute to research regarding ownership structure and also determinants of tax avoidance. Nevertheless, this study experienced some limitations. The first challenge came across during the search for prior research providing information on the role of ownership types and tax avoidance. It was not possible to find the ultimate owners in many cases. Databases were either not found or required financial resources. Whereas Orbis and the financial reports provided some information, often the ultimate owners aggravated the problem again through tactics they used in order to hide their identity. They did so by for instance by mentioning names, which were not traceable by the web or they owned the firm via another firm at which at some point the information regarding the owners stopped. Namely, those were located in the virgin islands e.g. and belong again to a network of firms. Also, ownership information in Orbis did not always comply with that of the financial reports, in which the reports were chosen since these have to undergo audits.

Other limitations were the transparency of the firms' financial reports. Many firms provided financial reports only in Bahasa (Indonesian language). Also, some pages like those containing their shareholder information were scanned poorly making them impossible to read.

Next, Orbis, which provided financial data in United States dollar (USD), reported the data only for a couple of years. Thus, prior years financial data had to be gathered completely from the firms' reports. Therefore additionally, in some occasions the currency needed to be converted from Rupiah to USD.

These limitations can be reference points for further research. Researchers who plan to investigate ownership structure should look at different kind of industries since they might differ regarding their owners' identities. Furthermore, it might be interesting to study public mining companies in other emerging areas in order to compare them and to find possible similarities. The findings then can be compared with developed countries's findings. Investigating private firms might entail different results.

More research and alignment of them regarding the effect of ownership types and companies, could possibly influence and improve law regulations within the firm but also nationwide regarding taxes in order to prevent scandals. If there is enough scientific proof and information, one might achieve huge impact on the injustice brought by the tunnelling of money within such companies.

The effects of other firm insiders could also be an interesting subject to look at such as managers and board of directors connection towards tax avoidance. Some prior studied their role, but further research might investigate them additionally together with other types of owners, hence take type-I as well as type-II agency perspectives. Further research might also consider another interesting proxy for tax avoidance, namely related party transactions, as these are also available in the financial reports and seem to belong to the tunnelling activities.

One more suggestion for further research is the time aspects of the study. Most of the prior research referred to in this study used couple of years in their dataset, whereas including more years might provide other interesting observations like trends.

Studies like this rely and depend much on the availability of data and trustworthy information, which seems to be lacking due to purposely hiding or other manipulations. An idea could be to cooperate with other institutions like governments or federal agencies. In the example of Netherlands further research could cooperate with the Fiscal Information and Investigation Service (FIOD), which investigates financial crimes. Such institutions might have valuable knowledge and tools for this kind of research.

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8 APPENDICES

8.1 Appendix A: Shapiro-Wilk Test of Normal Distribution

Variable	Statistic	Sig.
PBT	9.097	0.00
ETR	7.253	0.00
CTR	6.850	0.00
%FAM	9.270	0.00
%GOV	7.433	0.00
%DOMC	7.373	0.00
%DOMI	8.747	0.00
%FOR	7.360	0.00
%PUB	4.114	0.00
FAM	3.403	0.00
GOV	5.379	0.00
DOMC	-2.969	1.00
DOMI	1.772	0.04
FOR	-2.503	0.99
PUB	8.560	0.00
Size	8.142	0.00
Debt Ratio	7.519	0.00
ROA	6.193	0.00

8.2 Appendix B: VIF Values

Table B1. Test for multicollinearity for the independent variables by PBT

Variable	VIF	1/VIF
Size	29.44	0.034
Debt Ratio	7.26	0.138
PUB	7.06	0.142
FOR	4.33	0.230
DOMC	3.96	0.253
GOV	2.85	0.351
DOMI	2.42	0.414
FAM	2.08	0.480
ROA	1.76	0.568
Mean VIF	6.79	

Table B2. Test for multicollinearity for the independent variables by ETR

Variable	VIF	1/VIF
Size	29.44	0.034
Debt Ratio	7.26	0.138
PUB	7.06	0.142
FOR	4.33	0.231
DOMC	3.96	0.253
GOV	2.85	0.351
DOMI	2.42	0.414
FAM	2.08	0.480
ROA	1.76	0.568
Mean VIF	6.79	

Table B3. Test for multicollinearity for the independent variables by CETR

Variable	VIF	1/VIF
Size	30.77	0.033
Debt Ratio	7.52	0.133
PUB	7.26	0.138
FOR	4.55	0.220
DOMC	3.94	0.254
GOV	2.89	0.346
DOMI	2.50	0.401
FAM	2.16	0.463
ROA	1.77	0.565
Mean VIF	7.04	

8.3 Appendix C: Regression Analysis with RE/ FE on ETR and PBT

Table C1. Regression results ETR
Regression of ETR is estimated using a random-effects or fixed-effects model

ETR															
Panel A. Ownership types as percentage															
		Model 1							Model 2						
	Pred. Sign	All	FAM	GOV	DOMC	DOMI	FOR	PUB	All	FAM	GOV	DOMC	DOMI	FOR	PUB
		RE	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE	
FAM	-	.461** (2.06)	.164 (1.38)						.325 (1.20)	0.065 (0.32)					
GOV	-	.250 (1.11)		-.108 (-1.21)					.232 (1.00)		-.091 (-0.67)				
DOMC	+	.362* (1.72)			.134** (1.96)				.331* (1.70)			.129* (1.74)			
DOMI	-	.058 (0.17)				-.092 (-0.34)			.006 (0.02)				-.121 (-0.88)		
FOR	-	.121 (0.46)					-.096 (-1.04)		.103 (0.48)					-.077 (-0.80)	
PUB	.	.269 (1.49)						.124 (0.99)	.334* (1.87)						.181 (1.07)
Size		.018 (1.46)	0.17 (1.51)	.016 (1.47)	.018* (1.68)	.017 (1.51)	.018 (1.54)	.016 (1.37)							
Debt Ratio		.085 (0.94)	0.65 (0.78)	.057 (0.69)	.069 (0.88)	.068 (0.80)	.050 (0.57)	.047 (0.59)							

ROA	.288** (1.99)	.292** (2.04)	.287** (2.05)	.276* (1.93)	.279** (1.96)	.272* (1.91)	.273** (1.99)								
Constant	-.178 (-0.64)	-.000 (-0.01)	.016 (0.10)	-.038 (-0.24)	.021 (0.12)	.048 (0.30)	.020 (0.12)	.154 (0.73)	.284*** (0.00)	.284*** (3.85)	.270*** (35.10)	.312*** (3.88)	.326*** (6.19)	.264*** (0.00)	
Firm effect	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	
Year effect	no	no	no	no	no	no	no	no	no	no	no	no	no	no	
Hausman test (p-value)	0.65	0.76	0.84	0.32	0.77	0.73	0.83	0.52	0.93	0.42	0.06	0.42	0.68	0.65	
Modified Wald test (p-value)															
White test (p-value)	0.02	0.01	0.01	0.01	0.02	0.02	0.02	0.06	0.06	0.06	0.04	0.10	0.04	0.05	
F-Test (p-value)															
Chi-2-Test (p-value)	.	.	.	.	.	.	.	88.02*** (0.00)	83.00*** (0.00)	83.45*** (0.00)	.	83.85*** (0.00)	.	.	
Adjusted R2	0.159	0.159	0.159	0.167	0.159	0.160	0.151	0.131	0.131	0.132	0.139	0.133	0.132	0.127	
N	323	325	325	325	325	325	323	325	327	327	327	327	327	325	

Panel B. Ownership types as dummy

		Model 3							Model 4						
	Pred. Sign	All	FAM	GOV	DOMC	DOMI	FOR	PUB	All	FAM	GOV	DOMC	DOMI	FOR	PUB
		RE	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE	FE	RE	RE
FAM	-	-.014 (-0.32)	0.21 (0.63)						-.034 (-0.72)	.002 (0.04)					

GOV	-	.030 (-0.44)		-.072 (-1.26)					-.015 (-0.23)		-.060 (-0.70)				
DOMC	+	.039 (0.74)			.064 (1.58)				.046 (0.83)			.071 (1.64)			
DOMI	-	-.168*** (-2.93)				-.148** (-2.14)			-.178*** (-3.19)				-.155** (-2.33)		
FOR	-	-.058 (-0.90)					-.043 (-0.72)		-.065 (-1.05)					-.050 (-0.84)	
PUB	.	.115 (1.11)						.038 (0.58)	.124 (0.27)						.036 (0.42)
Size		.015 (1.34)	.017 (1.52)	.016 (1.47	.019* (1.67)	.016 (1.47)	0.017 (1.51)	.017 (1.45)							
Debt Ratio		.086 (1.10)	.062 (0.76)	.057 (0.69)	.063 (0.79)	.094 (1.05)	.062 (0.76)	.056 (0.70)							
ROA		.270** (2.00)	.283** (1.99)	.287** (2.05)	.259* (1.84)	.276** (2.01)	.278** (1.98)	.282* (1.96)							
Constant		.081 (0.41)	.000 (0.00)	.016 (0.10)	-.086 (-0.52)	.137 (0.75)	.045 (0.29)	-.022 (-0.12)	.358*** (3.28)	.284*** (3.84)	.284*** (3.85)	.213*** (4.94)	.318*** (17.08)	.334*** (5.61)	.248** (2.18)
Firm effect		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year effect		no	no	no	no	no	no	no	no	no	no	no	no	no	no
Hausman test (p-value)		0.11	0.74	0.85	0.44	0.09	0.81	0.48	0.05	0.43	0.43	0.06	0.02	0.89	0.42
Modified Wald test (p-value)													0.00		
White's test (p-value)		0.00	0.02	0.01	0.01	0.01	0.01	0.02	0.01	0.06	0.06	0.03		0.04	0.07
F-Test (p-value)													5.44** (0.03)		

Chi-2-Test (p-value)	.	.	.	.	.	.	.	.	82.87*** (0.00)	83.49*** (0.00)	.		.	79.34*** (0.00)
Adjusted R2	0.176	0.158	0.159	0.166	0.184	0.160	0.150	0.156	0.130	0.132	0.141	0.031	0.134	0.123
N	323	325	325	325	325	325	323	325	327	327	327	327	327	325

Notes: This table reports regression results for the dependent variable ETR as proxy for tax avoidance. A panel data model is applied for the regressions and those are estimated with annual data for the period of 2004–2018. In Panel A, the tests are run with the ownership types as percentage, whereas in Panel B they are run as dummy variable. Model 1 and 3 include the control variables, which are excluded in Model 2 and 4. Depending on the Hausman test results the F-statistic is shown for the fixed-effects model and White's test statistics for the random-effects model. In case the Modified Wald test for FE model or Wald Chi-2-Test for RE model indicate significant results, the regression is run with robust standard errors to fix for heteroscedasticity. Individual-specific dummies are included in all models as they showed significant effect on the regression results. Time-specific dummies did not show any significant effect on the regression outcomes, thus they are not included in any model.
The results of the T-statistics as well as the p-value of the F-Test and Wald Chi-2-Test are shown in parentheses. In some cases the addition of robust standard errors leads to missing F-Tests and Wald Chi-2-Tests. An explanation is given in Regression Diagnosis. See Table 3 for variable definitions.
* Statistical significance at 10% level.
** Statistical significance at 5% level.
*** Statistical significance at 1% level.

Table C2. Regression results PBT
Regression of PBT is estimated using a random-effects or fixed-effects model

		PBT													
Panel A. Ownership types as percentage															
		Model 1							Model 2						
	Pred. Sign	All	FAM	GOV	DOMC	DOMI	FOR	PUB	All	FAM	GOV	DOMC	DOMI	FOR	PUB
		RE	FE	FE	FE	FE	FE	FE	RE	RE	FE	RE	RE	RE	RE
FAM	-	-198.6 (-1.30)	16.0 (0.27)						-43.7 (-0.25)	17.1 (0.13)					
GOV	-	- 225.6 (-1.26)		4.3 (0.05)					-57.5 (-0.38)		8.8 (0.10)				
DOMC	+	-219.1 (-1.47)			-27.1 (-0.68)				-58.8 (-0.47)			-21.9 (-0.45)			
DOMI	-	-139.0 (-0.72)				130.2 (1.61)			-5.7 (-0.03)				64.7 (0.72)		
FOR	-	-261.2 (-1.16)					-125.4 (-1.25)		-60.0 (-0.44)					-60.6 (-1.00)	
PUB	.	142.6 (1.09)						270.5 (1.64)	205.0* (1.79)						239.8*** (2.61)
Size		10.5* (1.81)	13.0* (1.80)	13.0* (1.83)	12.8* (1.80)	13.1* (1.84)	14.4* (2.01)	9.2 (1.62)							
Debt Ratio		-244.5** (-2.39)	-189.9** (-2.31)	-190.2** (-2.31)	-191.6** (-2.31)	-199.9** (-2.32)	-203.8** (-2.30)	-214.8** (-2.40)							
Constant		338.3 (1.27)	75.1 (0.93)	75.8 (0.96)	81.4 (1.03)	73.8 (0.91)	109.3 (1.22)	75.4 (0.94)	33.1 (0.17)	-11.0 (-0.08)	54.3** (2.10)	-11.1 (-0.08)	-25.2 (-0.17)	27.8 (0.19)	-13.7 (-0.10)
Firm effect		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year effect		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Hausman test (p-value)	0.02	0.02	0.01	0.00	0.02	0.02	0.00	0.09	0.99	0.01	0.06	0.87	0.93	0.76
Modified Wald test (p-value)		0.00	0.00	0.00	0.00	0.00	0.00			0.00				
White test (p-value)	0.00							0.58	0.46		0.46	0.48	0.47	0.57
F-Test (p-value)		.	.	.	.	.	.			.				
Chi-2-Test (p-value)	.							468.91*** (0.00)	462.43*** (0.00)		462.93*** (0.00)	463.77*** (0.00)	465.05*** (0.00)	475.78*** (0.00)
Adjusted R2	0.609	0.190	0.190	0.191	0.196	0.203	0.217	0.562	0.559	0.115	0.559	0.560	0.561	0.569
N	323	326	326	326	326	326	323	325	328	328	328	328	328	325

Panel B. Ownership types as dummy

		Model 3							Model 4						
	Pred. Sign	All	FAM	GOV	DOMC	DOMI	FOR	PUB	All	FAM	GOV	DOMC	DOMI	FOR	PUB
		FE	FE	FE	FE	FE	FE	FE	RE	RE	FE	FE	FE	RE	RE
FAM	-	-13.9 (-0.51	2.5 (0.12)						-9.5 (-0.26)	10.4 (0.29)					
GOV	-	-16.8 (-0.24)		2.2 (0.04)					-16.4 (-0.26)		5.2 0.10)				
DOMC	+	-21.7 (-0.54)			5.2 (0.16)				-24.2 (-0.86)			4.3 (0.13)			
DOMI	-	-7.1 (-0.23)				11.4 (0.28)			-27.0 (-0.80)				-11.9 (-0.38)		
FOR	-	-92.3*** (-1.54)					-81.7 (-1.47)		-91.1*** (-2.75)					-78.5*** (-2.61)	

PUB	.	15.8 (0.26)						-5.6 (-0.08)	-1.8 (-0.00)					-27.7 (-0.50)
Size		12.2** (2.17)	13.0* (1.81)	13.0* (1.83)	13.0* (1.86)	13.0* (1.83)	13.2** (2.18)	12.8* (1.86)						
Debt Ratio		-193.9** (-2.48)	-190** (-2.29)	-190.2** (-2.31)	-189.9** (-2.31)	-192.8** (-2.28)	-189.0** (-2.53)	-190.0** (-2.26)						
Constant		230.0 (1.61)	75.7 (0.92)	76.0 (0.96)	74.4 (1.01)	75.2 (0.94)	198.3 (1.62)	84.0 (0.76)	214.5 (1.24)	-10.8 (-0.08)	54.4** (2.13)	54.8** (2.32)	9.7 (0.01)	139.1 (0.91)	16.5 (0.11)
Firm effect		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year effect		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Hausman test (p-value)		0.02	0.01	0.01	0.00	0.01	0.03	0.02	0.11	0.75	0.00	0.02	0.94	0.83	0.67
Modified Wald test (p-value)		0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00			
White's test (p-value)									0.58	0.46			0.45	0.55	0.47
F-Test (p-value)		.	.	.	.	.	.	.			.	.			
Chi-2-Test (p-value)									470.57*** (0.00)	462.62*** (0.00)			462.76*** (0.00)	480.55*** (0.00)	458.39*** (0.00)
Adjusted R2		0.750	0.190	0.190	0.190	0.190	0.212	0.191	0.563	0.559	0.115	0.116	0.559	0.570	0.559
N		323	326	326	326	326	326	323	325	328	328	328	328	328	325

Notes: This table reports regression results for the dependent variable PBT as proxy for tax avoidance. Coefficients are reported in million (USD). A panel data model is applied for the regressions and those are estimated with annual data for the period of 2004–2018. In Panel A, the tests are run with the ownership types as percentage, whereas in Panel B they are run as dummy variable. Model 1 and 3 include the control variables, which are excluded in Model 2 and 4. Depending on the Hausman test results the F-statistic is shown for the fixed-effects model and Wald Chi-2-Test statistics for the random-effects model. In case the Modified Wald test for FE model or White's test for RE model indicate

significant results, the regression is run with robust standard errors to fix for heteroscedasticity. Individual-specific dummies and time-specific dummies are included in all models as they showed a significant effect on the regression outcomes in all of them.
The results of the T-statistics as well as the p-value of the F-Test and Wald Chi-2-Test are shown in parentheses. In this analysis, the addition of robust standard errors leads to missing F-Tests and in some cases to missing Wald Chi-2-Tests. An explanation is given in Regression Diagnosis. See Table 3 for variable definitions.
* Statistical significance at 10% level.
** Statistical significance at 5% level.
*** Statistical significance at 1% level.

8.4 Appendix D: Complete Tables First-Difference Regression Results

Table D1. First-difference regression results on CETR

		CETR													
Panel A. Ownership types as percentage															
		Model 1							Model 2						
	Pred. Sign	All	FAM	GOV	DOMC	DOMI	FOR	PUB	All	FAM	GOV	DOMC	DOMI	FOR	PUB
		.786 (1.43)	.066 (0.15)						.611 (1.10)	.105 (0.23)					
FAM	-	.870** (1.98)		.021 (0.08)					.580 (1.33)		-.029 (-0.10)				
GOV	-	.875** (2.43)			.386** (2.26)				.632* (1.78)			.367** (2.15)			
DOMC	+	.482 (1.08)				.215 (0.33)			.319 (0.72)				.256 (0.37)		
DOMI	-	.131 (0.34)					-.375 (-1.21)		-.119 (-0.32)					-.440** (-2.14)	
FOR	-	-.035 (-0.10)						-.274 (-0.99)	-.158 (-0.46)						-.249 (-0.91)
Size		.002 (0.07)	-.006 (-0.30)	-0.06 (-0.30)	-.002 (-0.08)	-.007 (-0.38)	-.000 (-0.02)	-.006 (-0.27)							
Debt Ratio		.512*** (2.89)	.438** (2.55)	.439** (2.56)	.477*** (2.79)	.424** (2.42)	.420** (2.49)	.435** (2.51)							
ROA		.487*** (2.79)	.496*** (2.86)	.497*** 2.86)	.467*** (2.71)	.501** (2.51)	.468** (2.28)	.505*** (2.90)							
Constant		-.009 (-0.43)	-.008 (-0.39)	-.008 (-0.37)	-.012 (-0.57)	-.008 (-0.39)	-0.009 (-0.41)	-.007 (-0.31)	-.005 (-0.22)	-0.004 (-0.18)	-.004 (-0.19)	-.007 (-0.34)	-.004 (-0.20)	-.005 (-0.22)	-.003 (-0.13)

White test (p-value)	0.30	0.78	0.98	0.98	0.00	0.02	0.94	0.13	0.98	0.64	0.78	0.00	0.09	0.84
F-test (p-value)	2.80*** (0.00)	3.08** (0.02)	0.017** (0.046)	4.42*** (0.00)	2.45** (0.05)	3.06** (0.017)	3.40*** (0.00)	1.79 (0.10)	0.05 (0.818)	0.01 (0.92)	4.64** (0.032)	0.14 (0.71)	4.57** (0.03)	0.83 (0.36)
Adjusted R2	0.059	0.031	0.031	0.050	0.033	0.043	0.036	0.018	-0.004	-0.004	0.014	-0.001	0.013	-0.000
N	259	261	261	261	261	261	259	261	263	623	263	263	263	261

Panel B. Ownership types as dummy

		Model 3							Model 4						
	Pred. Sign	All	FAM	GOV	DOMC	DOMI	FOR	PUB	All	FAM	GOV	DOMC	DOMI	FOR	PUB
FAM	-	.123 (0.99)	.249** (2.07)						.141 (1.13)	.279** (2.31)					
GOV	-	.068 (0.38)		.016 (0.09)					.023 (0.13)		-.017 (-0.10)				
DOMC	+	.076 (0.89)			.134* (1.71)				.058 (0.69)			.142* (1.86)			
DOMI	-	-.119 (-1.42)				-.075 (-0.90)			-.134 (-1.59)				-.098 (-0.69)		
FOR	-	-.321*** (-3.36)					-.341*** (-3.93)		-.324*** (-3.45)					-.343*** (-4.12)	
PUB	.	-.005 (-0.03)						-.007 (-0.04)	.003 (0.01)						001 (0.01)
Size		.007 (0.33)	-.001 (-0.07)	-.006 (-0.30)	-.002 (-0.07)	-.006 (-0.28)	.002 (0.09)	-.007 (-0.35)							.
Debt Ratio		.347** (2.03)	.407** (2.38)	.440** (2.56)	.463** (2.58)	.447** (2.60)	.339** (2.01)	.441** (2.55)							

ROA	.414** (2.40)	.480*** (2.78)	.497*** (2.86)	.463*** (2.67)	.478*** (2.74)	.453*** (2.68)	.509*** (2.92)							
Constant	-.009 (-0.45)	-.012 (-0.57)	-.008 (-0.37)	-.009 (-0.43)	-.008 (-0.38)	-.009 (-0.43)	-.008 (-0.36)	-.008 (-0.38)	-.008 (-0.38)	-.004 (-0.19)	-.005 (-0.23)	-.003 (-0.16)	-.006 (-0.31)	-.004 (-0.18)
White test (p-value)	0.50	0.93	0.97	0.99	0.12	0.94	0.95	0.16	0.37	0.35	0.83	0.00	0.52	0.63
F-test (p-value)	3.67*** (0.00)	4.20*** (0.00)	3.08** (0.02)	3.85*** (0.00)	3.29** (0.01)	7.13*** (0.00)	3.14** (0.02)	3.67*** (0.00)	5.34** (0.02	0.01 (0.92)	3.45* (0.06)	0.48 (0.49)	16.97*** (0.00)	0.00 (1.00)
Adjusted R2	0.085	0.047	0.031	0.041	0.034	0.086	0.032	0.058	0.016	-0.004	0.009	0.001	0.058	-0.004
N	259	261	261	261	261	261	259	261	263	263	263	263	263	263

Notes: This table reports regression results for the changes in the dependent variable CETR as proxy for tax avoidance. A panel data model is applied for the regressions and those are estimated with annual data for the period of 2004–2018. In Panel A, the tests are run with the ownership types as percentage, whereas in Panel B they are run as dummy variable. Model 1 and 3 include the control variables, which are excluded in Model 2 and 4. In case the White's test indicate significant results, the regression is run with robust standard errors to fix for heteroscedasticity.
The results of the t-statistics are shown in parentheses. See Table 3 for variable definitions
* Statistical significance at 10% level.
** Statistical significance at 5% level.
*** Statistical significance at 1% level.

Table D2. First-difference regression results on ETR

		ETR													
Panel A. Ownership types as percentage															
		Model 1							Model 2						
	Pred. Sign	All	FAM	GOV	DOMC	DOMI	FOR	PUB	All	FAM	GOV	DOMC	DOMI	FOR	PUB
FAM	-	.939** (2.56)	.284 (0.77)						.886** (2.01)	.313 (0.84)					
GOV	-	.878*** (3.07)		.090 (0.40)					.729** (2.09)		.047 (0.21)				
DOMC	+	.813*** (2.85)			.205 (1.55)				.708** (2.58)			.204 (1.55)			
DOMI	-	.512 (0.88)				.003 (0.01)			.431 (1.19)				.018 (0.03)		
FOR	-	.459 (1.27)					-.190 (- 1.03)		.337 (1.10)					-.211 (-1.24)	
PUB	.	.492* (1.85)						.059 (0.28)	.409 (1.52)						.055 (0.26)
Size		.009 (0.58)	.009 (0.57)	.009 (0.58)	.012 (0.76)	.009 (0.63)	.012 (0.78)	.009 (0.54)							
Debt Ratio		.324** (2.02)	.252* (1.85)	.258* (1.89)	.270* (1.98)	.256 (1.64)	.247 (1.54)	.260* (1.89)							
ROA		.426*** (2.59)	.252*** (2.99)	.413*** (3.00)	.396*** (2.88)	.411** (2.59)	.398** (2.43)	.415*** (2.99)							
Constant		-.004 (-0.21)	-.004 (-0.25)	-.003 (-0.20)	-.005 (-0.31)	-.004 (-0.24)	-.004 (-0.24)	-.004 (-0.25)	-.001 (-0.08)	-.001 (-0.08)	-.001 (-0.05	-.002 (-0.14)	-.001 (-0.07)	-.001 (-0.08)	-.002 (-0.09)
White test (p-value)		0.68	0.06	0.51	0.45	0.00	0.03	0.46	0.12	0.61	0.67	0.63	0.00	0.99	0.52
F-test (p-value)		2.38** (0.01)	3.26** (0.01)	3.15** (0.02)	3.74*** (0.00)	3.23** (0.01	3.53*** (0.00)	3.12** (0.02)	1.53 (0.17)	0.70 (0.40)	0.04 (0.84)	2.42*** (0.00)	0.00 (0.98)	1.54 (0.22)	0.07 (0.79)

Adjusted R2		0.048	0.030	0.029	0.037	0.028	0.033	0.029	0.011	-0.001	-0.003	0.005	-0.003	0.002	-0.003
N		288	290	290	290	290	290	288	291	293	293	293	293	293	291

Panel B. Ownership types as dummy

		Model 3							Model 4						
	Pred. Sign	All	FAM	GOV	DOMC	DOMI	FOR	PUB	All	FAM	GOV	DOMC	DOMI	FOR	PUB
FAM	-	-.015 (-0.14)	.070 (0.69)						-.015 (-0.14)	.079 (0.77)					
GOV	-	.087 (0.58)		.057 (0.40)					.057 (0.37)		.029 (0.20)				
DOMC	+	.043 (0.62)			.081 (1.27)				.038 (0.55)			.092 (1.47)			
DOMI	-	-.168*** (-2.61)				-.153** (-2.42)			-.182*** (-2.81)				-.166*** (-2.61)		
FOR	-	-.186** (-2.56)					-.169** (-2.50		-.185*** (-2.66)					-.172*** (-2.64)	
PUB	.	.087 (0.69)						.054 (0.43)	.098 (0.77)						.060 (0.47)
Size		.015 (0.96)	.010 (0.64)	.009 (0.58)	.012 (0.72)	.010 (0.62)	.014 (0.86)	.009 (0.54)							
Debt Ratio		.208 (1.51)	.248* (1.81)	.258* (1.89)	.255* (1.88)	.260** (1.93)	.200 (1.46)	.260* (1.89)							
ROA		.362*** (2.64)	.407*** (2.96)	.413*** (3.00)	.394*** (2.86)	.383*** (2.81)	.396*** (2.91)	.413*** (2.99)							
Constant		-.003 (-0.17)	-.005 (-0.30)	-.003 (-0.20)	-.005 (-0.28)	-.004 (-0.25)	-.004 (-0.22)	-.004 (-0.24)	-.002 (-0.10)	-.002 (-0.14)	-.001 (-0.05)	-.002 (-0.13)	-.001 (-0.07)	-.002 (-0.11)	-.001 (-0.09)

White test (p-value)	0.84	0.46	0.46	0.44	0.28	0.39	0.55	0.95	0.68	0.37	1.00	0.28	0.44	0.79
F-test (p-value)	3.06*** (0.00)	3.23 (0.013)	3.15** (0.02)	3.53*** (0.00)	4.64*** (0.00)	4.74*** (0.00)	3.15** (0.02)	2.75** (0.01)	0.60 (0.44)	0.04 (0.84)	2.15 (0.14)	6.84*** (0.00)	6.95*** (0.00)	0.22 (0.64)
Adjusted R2	0.061	0.030	0.029	0.034	0.048	0.049	0.029	0.035	-0.001	-0.003	0.004	0.020	0.020	-0.003
N	288	290	290	290	290	290	288	291	293	293	293	293	293	291

Notes: This table reports regression results for the changes in the dependent variable ETR as proxy for tax avoidance. A panel data model is applied for the regressions and those are estimated with annual data for the period of 2004–2018. In Panel A, the tests are run with the ownership types as percentage, whereas in Panel B they are run as dummy variable. Model 1 and 3 include the control variables, which are excluded in Model 2 and 4. In case the Wald Chi-2-Test indicate significant results, the regression is run with robust standard errors to fix for heteroscedasticity.
The results of the t-statistics as well as the p-value of the F-test are shown in parentheses. See Table 3 for variable definitions
* Statistical significance at 10% level.
** Statistical significance at 5% level.
*** Statistical significance at 1% level.

Table D3. First-difference regression results on PBT

		PBT													
Panel A. Ownership types as percentage															
		Model 1							Model 2						
	Pred. Sign	All	FAM	GOV	DOMC	DOMI	FOR	PUB	All	FAM	GOV	DOMC	DOMI	FOR	PUB
FAM	-	-105.8 (-0.51)	5.2 (0.03)						-43.9 (-0.21)	-14.6 (-0.08)					
GOV	-	-298.5* (-1.79)		-175.9* (-.165)					-205.8 (-1.23)		-174 (-1.62)				
DOMC	+	-127.7 (-0.97)			50.5 (0.81)				-32.8 (-0.25)			48.8 (0.78)			
DOMI	-	-129.1 (-0.75)				17.8 (0.15)			-41.6 (-0.24)				-9. (-0.08)		
FOR	-	-171.5 (-1.15)					-49.1 (-0.61)		-34.4 (0.24)					-6.2 (-0.08)	
PUB	.	-102.4 (-0.78)						-6.9 (-0.07)	5.8 (0.05)						25.7 (0.26)
Size		14.4* (1.91)	12.9* (1.82)	12.5* (1.79)	13.4* (1.90)	12.8* (1.82)	13.5* (1.90)	13.2* (1.80)							
Debt Ratio		-188.8** (-2.89)	-174.4*** (-2.78)	-177.3*** (-2.83)	-170.9*** (-2.71)	-175.7*** (-2.78)	-176.6*** (-2.81)	-174.4*** (-2.72)							
Constant		3.3 (0.41)	4.6 (0.58)	3.1 (0.39)	4.3 (0.54)	4.6 (0.58)	4.6 (0.58)	4.6 (0.58)	1.7 (0.21)	3.3 (0.42)	1.8 (0.23)	3.0 (0.38)	3.3 (0.42)	3.3 (0.42)	3.2 (0.40)
White test (p-value)		1.00	0.97	0.98	0.97	0.86	0.94	0.87	1.00	0.83	0.97	0.86	0.85	0.77	0.39
F-test (p-value)		2.14* (0.06)	4.38*** (0.00)	5.34*** (0.00)	4.61*** (0.00)	4.39*** (0.00)	4.51*** (0.00)	4.36*** (0.00)	0.45 (0.85)	0.01 (0.94)	2.61 (0.11)	0.62 (0.43)	0.01 (0.94)	0.01 (0.94)	0.07 (0.80)
Adjusted R2		0.031	0.034	0.043	0.036	0.034	0.035	0.034	-0.012	-0.003	0.005	-0.001	-0.003	-0.003	-0.003

N		288	291	291	291	291	291	288	291	294	294	294	294	294	291

Panel B. Ownership types as dummy

		Model 3							Model 4						
	Pred. Sign	All	FAM	GOV	DOMC	DOMI	FOR	PUB	All	FAM	GOV	DOMC	DOMI	FOR	PUB
FAM	-	14.4 (0.29)	25.7 (0.54)						-2.7 (-0.05)	1.4 (0.03)					
GOV	-	-130.3* (-1.81)		-113.5* (-1.69)					-128.5* (-1.76)		-111.7 (-1.64)				
DOMC	+	-21.7 (-0.65)			5.8 (0.19)				-22.4 (-0.68)			-0.4 (-0.01)			
DOMI	-	-46.8 (-1.53)				-43.9 (-1.47)			-49.0 (-1.58)				-47.0 (-1.56)		
FOR	-	-16.1 (-0.46)					-6.6 (-0.21)		3.4 (0.10)					17.0 (0.55)	
PUB	·	31.1 (0.51)						27.5 (0.46)	39.3 (0.64)						39.7 (0.65)
Size		12.5* (1.69)	13.2* (1.87)	12.5* (1.79)	13.0* (1.83)	12.8* (1.82)	13.0* (1.84)	12.9* (1.77)							
Debt Ratio		-182.1** (-2.81)	-177.6*** (-2.81)	-177.6*** (-2.84)	-174.6*** (-2.77)	-172.1*** (-2.75)	-176.8*** (-2.77)	-173.8*** (-2.72)							
Constant		2.7 (0.33)	4.2 (0.54)	3.0 (0.39)	4.5 (0.57)	4.5 (0.58)	4.6 (0.58)	4.4 (0.56)	1.7 (0.21)	3.3 (0.41)	1.8 (0.22)	3.3 (0.42)	3.3 (0.42)	3.4 (0.42)	3.2 (0.40)
White test (p-value)		1.00	0.97	0.96	0.96	0.97	0.89	0.98	1.00	0.79	0.82	0.68	0.96	0.69	0.96
F-test (p-value)		2.38** (0.02)	4.48*** (0.00)	5.38*** (0.00)	4.40*** (0.00)	5.14*** (0.00)	4.40*** (0.00)	4.43*** (0.00)	1.01 (0.42)	0.00 (0.98)	2.70 (0.10)	0.00 (0.99)	2.42 (0.12)	0.30 (0.59)	0.42 (0.52)

Adjusted R2	0.037	0.035	0.043	0.034	0.041	0.034	0.035	0.000	-0.003	0.006	-0.003	0.005	-0.002	-0.002
N	288	291	291	291	291	291	288	291	294	294	294	294	294	291

Notes: This table reports regression results for the changes in the dependent variable PBT as proxy for tax avoidance. Coefficients are reported in million (USD). A panel data model is applied for the regressions and those are estimated with annual data for the period of 2004–2018. In Panel A, the tests are run with the ownership types as percentage, whereas in Panel B they are run as dummy variable. Model 1 and 3 include the control variables, which are excluded in Model 2 and 4.In case the Wald Chi-2-Test indicate significant results, the regression is run with robust standard errors to fix for heteroscedasticity.
The results of the t-statistics as well as the p-value of the F-test are shown in parentheses. See Table 3 for variable definitions
* Statistical significance at 10% level.
** Statistical significance at 5% level.
*** Statistical significance at 1% level.

8.5 Appendix E: Comparison between RE/ FE and FD

Table E1. Comparison between RE/ FE regression method with first-difference method on ETR (only significant results reported)

		ETR															
		Panel. A								Panel B.							
		Model 1				Model 2				Model 3				Model 4			
	Pred. Sign	RE/ FE		FD		RE/ FE		FD		RE/ FE		FD		RE/ FE		FD	
		ALL	IND	ALL	IND	ALL	IND	ALL	IND	ALL	IND	ALL	IND	ALL	IND	ALL	IND
FAM	-	.461** (2.06)	.	.939** (2.56)	.	.	.	.886** (2.01)	.	.	.	.	.	.	.	.	.
GOV	-	.	.	.878*** (3.07)	.	.	.	.729** (2.09)	.	.	.	.	.	.	.	.	.
DOMC	+	.362* (1.72)	.134** (1.96)	.813*** (2.85)	.	.331* (1.70)	.129* (1.74)	.708** (2.58)	.	.	.	.	.	.	.	.	.
DOMI	-	.	.	.	.	.	.	.	.	-.168*** (-2.93)	-.148** (-2.14)	-.168*** (-2.61)	-.153** (-2.42)	-.178*** (-3.19)	-.155** (-2.33)	-.182*** (-2.81)	-.166*** (-2.61)
FOR	-	.	.	.	.	.	.	.	.	.	.	-.186** (-2.56)	-.169** (-2.50	.	.	-.185*** (-2.66)	-.172*** (-2.64)
PUB	.	.	.	.492* (1.85)	.	.334* (1.87)	.	.	.	.	.	.	.	.	.	.	.

Notes: This table reports only the significant regression results of the two-way error component and the first-difference methods for the dependent variable ETR as proxy for tax avoidance. A panel data model is applied for the regressions and those are estimated with annual data for the period of 2004–2018. In Panel A, the tests are run with the ownership types as percentage, whereas in Panel B they are run as dummy variable. Model 1 and 3 include the control variables, which are excluded in Model 2 and 4. RE/ FE stands for the two-way error component analysis, whereas FD represents the first-difference method. ALL stands for the regression models, which include all ownership types. IND represents sole ownership.
* Statistical significance at 10% level.
** Statistical significance at 5% level.
*** Statistical significance at 1% level.

Table E2. Comparison between RE/ FE regression method with first-difference method on PBT (only significant results reported)

		PBT															
		Panel. A								Panel B.							
		Model 1				Model 2				Model 3				Model 4			
	Pred. Sign	RE/ FE		FD		RE/ FE		FD		RE/ FE		FD		RE/ FE		FD	
		ALL	IND	ALL	IND	ALL	IND	ALL	IND	ALL	IND	ALL	IND	ALL	IND	ALL	IND
FAM	-	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
GOV	-	.	.	-298.5* (-1.79)	-175.9* (-.165)	.	.	.	.	.	.	-130.3* (-1.81)	-113.5* (-1.69)	.	.	-128.5* (-1.76)	.
DOMC	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
DOMI	-	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
FOR	-	.	.	.	.	.	.	.	.	-92.3*** (-1.54)	.	.	.	-91.1*** (-2.75)	-78.5*** (-2.61)		
PUB	.	.	.	.	.	205.0* (1.79)	239.8*** (2.61)	.	.	.	.	.	.	.	.	.	.

Notes: This table reports only the significant regression results of the two-way error component and the first-difference methods for the dependent variable PBT as proxy for tax avoidance. A panel data model is applied for the regressions and those are estimated with annual data for the period of 2004–2018. In Panel A, the tests are run with the ownership types as percentage, whereas in Panel B they are run as dummy variable. Model 1 and 3 include the control variables, which are excluded in Model 2 and 4. RE/ FE stands for the two-way error component analysis, whereas FD represents the first-difference method. ALL stands for the regression models, which include all ownership types. IND represents sole ownership.
* Statistical significance at 10% level.
** Statistical significance at 5% level.
*** Statistical significance at 1% level.

8.6 Appendix F: Thesis's Journals and Impact Factors

Table F1. Journals suggested by first supervisor Prof. dr. Kabir and their impact factors from 2018

Source: Wiley Online Library	Journal's impact factor
Accounting and Finance	
Cen, W., Tong, N., & Sun, Y. (2017)	1.481
Chan, K. H., Mo, P. L., & Zhou, A. Y. (2013)	
Accounting Review	
Dyreng, S. D., Hanlon, M., & Maydew, E. L. (2008)	
Graham, J. R., Hanlon, M., Shevlin, T., & Shroff, N. (2014)	4.562
Khan, M., Srinivasan, S., & Tan, L. (2017)	
McGuire, S. T., Wang, D., & Wilson, R. J. (2014)	
Wilson J, R. (2009)	
Applied Financial Economics	0.67
Al-Fayoumi, N. A., & Abuzayed, B. M. (2009)	
Journal of Banking and Finance	
Kabir, R., Li, H., & Veld-Merkoulova, Y. V. (2013)	
Lim, Y. (2011)	
Maury, B., & Pajuste, A. (2005)	2.205
Ruiz-mallorquí, M. V., & Santana-martín, D. J. (2011)	
Saghi-Zedek, N., & Tarazi, A. (2014)	
Unite, A. A., & Sullivan, M. J. (2003)	

Journal of Business Research	
Platt, H., & Platt, M. (2012)	4.028
Journal of Corporate Finance	
Huseynov, F., & Klamm, B. K. (2012)	
Minnick, K., & Noga, T. (2010)	2.349
Maury, B. (2006)	
Journal of Finance	
Ang, J. S., Cole, R., & Lin, J. W. (2000)	
Kim, E. H., & Ouimet, P. (2014)	6.201
La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (1999)	
Journal of Financial Economics	
Aggarwal, R., Erel, I., Ferreira, M., & Matos, P. (2011)	
Boone, A. L., & White, J. T. (2015)	
Chen, S., Chen, X., Cheng, Q., & Shevlin, T. (2010)	
Claessens, S., Djankov, S., & Lang, L. H. . (2000)	
Dahlquist, M., & Robertsson, G. (2001)	4.693
Graham, J. R., & Tucker, A. L. (2006)	
Hanlon, M., Lester, R., & Verdi, R. (2015)	
La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (2007)	
Lin, C., Ma, Y., Malatesta, P., & Xuan, Y. (2011)	
Myers, S. C., & Majluf, N. S. (1984)	
Strategic Management Journal	
Douma, S., George, R., & Kabir, R. (2006)	5.572

Thomsen, S., & Pedersen, T. (2000)

Table F2. Other journals used in thesis and their impact factors from 2018

Panel A. Source Web Of Science	Journal's impact factor
The Academy of Management Review Dharwadkar, R., George, G., & Brandes, P. (2000)	10.632
Econometrica White, H. (1980)	4.281
Journal of Accounting and Economics Armstrong, C. S., Blouin, J. L., Jagolinzer, A. Badertscher, B. A., Katz, S. P., & Rego, S. O. (2013) D., & Larcker, D. F. (2015) Hope, O. K., Ma, M. S., & Thomas, W. B. (2013)	3.753
Resources Policy Ouoba, Y. (2017). Schoenberger, E. (2016)	3.185
International Business Management Prabowo, M. A., Untoro, W., Trinugroho, I., & Angriawanb, A. (2014)	0.35
Journal of Financial and Quantitative Analysis Lai, S., & Teo, M. (2008) Lins, K. V. (2003)	2.266
Emerging Markets Review	2.266

Claessens, S., & Yurtoglu, B. B. (2013)	
Managerial Auditing Journal	1.064
Gaaya, S., Lakhal, N., & Lakhal, F. (2017)	
Journal of Business Research	4.028
Platt, H., & Platt, M. (2012)	
Journal of Contemporary Accounting and Economics	1.079
Richardson, G., Wang, B., & Zhang, X. (2016)	
Review of Economics and Statistics	3.636
Desai, A., M., & Dharmapala, D. (2009)	
Sustainability	
Fernández-Rodríguez, E., García-Fernández, R., & Martínez-Arias, A. (2019)	2.592
Horobet, A., Belascu, L., Curea, C. S., & Pentescu, A. (2019)	
Review of Financial Studies	4.975
Giannetti, M., & Laeven, L. (2009)	

Panel B. Source Research Gate	Journal's impact factor
Procedia Economics and Finance	1.42
Fitrianto, A., & Musakkal, K. F. N. (2016)	
Applied Economics	0.79
Peljhan, D., Zajc Kejžar, K., & Ponikvar, N. (2020)	
SAGE Open	0.68
Bickman, L., & Rog, D. J. (2013)	

Cooper, B. H. M., Patall, E. A., Lindsay, J. J., Cramer, D., & Howitt, D. (2011) Gill, J. (2011) Longhi, B. S., & Nandi, A. (2019) Singh, K. (2015)	
SSRN Electronic Journal Bradshaw, M., Guanmin, L., & Ma, M. S. (2016)	0.19
Corporate Ownership and Control Sudibyo, Y. A., & Jianfu, S. (2016)	0.28
National Tax Journal Cordes, J. J., & Galper, H. (1985)	0.96
Procedia - Social and Behavioral Sciences Annuar, H. A., Salihu, I. A., & Obid, S. N. S. (2014)	0.78
Development Christensen, J., & Murphy, R. (2004)	2.78
Journal of International Accounting Auditing and Taxation Cullinan, C. P., Wang, F., Wang, P., & Zhang, J. (2012) Wilkinson, B. R., Cahan, S. F., & Jones, G. (2001)	0.72
Journal of Public Economics Demirgüç-Kunt, A., & Huizinga, H. (2001)	2.00
International Journal of Accounting Krivogorsky, V. (2006)	0.63
Finance Research Letters	1.62

Lee, E. J., Chae, J., & Lee, Y. K. (2018)	
International Journal of Industrial Organization	0.95
Love, J. H., Roper, S., & Du, J. (2009)	
Public Money & Management	2.12
Mafrolla, E. (2019)	
Investment Management and Financial Innovations	0.50
Saleh, M., Zahirdin, G., & Octaviani, E. (2017)	
Research in International Business and Finance	1.28
Mishra, A. V. (2013)	
Geoforum	1.85
Reyes, J. A. D. L. (2017)	
The Quarterly Journal of Economics	15.11
Shleifer, A., & Vishny, R. W. (1994)	
Journal of Accounting, Auditing & Finance	0.41
Tang, T. Y. H. (2019)	

Panel C. Source Scimago Journal and Country Rank	Journal's impact factor
Journal of Accounting and Public Policy	
Lanis, R., & Richardson, G. (2011)	3.158
Brown, L. D., & Caylor, M. L. (2006)	
Wiley Interdisciplinary Reviews: Computational Statistics	1.022
Alin, A. (2010	

Family Business Review Sacristán-Navarro, M., Gómez-Ansón, S., & Cabeza-García, L. (2011)	7.545
Economics Letters Waldman, M. D. (1983)	0.767
Journal of Accounting, Ethics & Public Policy Landry, S., Deslandes, M., & Fortin, A. (2013)	0.112
National Tax Association Bennedsen, Morten, & Zeume, S. (2015)	0.899
Journal of Asia Business Studies Setiawan, D., Bandi, B., Phua, L. K., & Trinugroho, I.(2016)	0.468
Working thesis series (National Bureau of Economic Research) Kang, J., & Stulz, M. S. (1997)	3.18
Research Synthesis Methods Borenstein, M., Hedges, L. V, Higgins, J. P. T., & Rothstein, H. R. (2010)	2.60
Advances in Financial Economics Wahab, E. A. A., & Rahman, R. A. (2009)	0.101

Panel D. Source Wiley Online Library	Journal's impact factor
Corporate Governance: An International Review Jin, K., & Park, C. (2015) Kiesewetter, D., & Manthey, J. (2017) Liew, P. K. (2007) Utama, C. A., Utama, S., & Amarullah, F. (2017)	3.39

Econometrica Wallace, T. D., & Hussain, A. (1969)	3.992
International Economic Review Harvey, A. C. (1980)	1.560
Political Science Quarterly Bayulgen, O. (2012)	0.646
Journal of International Accounting Research Chan, K. H., Mo, P. L. L., & Tang, T. (2016)	4.891

Panel E. Sources of which impact factors are not know or other sources (reports, books, working thesis and theses)	Journal's Impact Factor
Cambridge University Press Hsiao, C. (2003)	n.d.
Oxford University Press Kendall, B. E. (2015)	n.d.
MIT Press Wooldridge J. M. (2010)	n.d
Private Sector and Development Curtis, B. M. (2011)	n.d
American Law & Economics Association Annual Meetings Desai, M. A., Dyck, A., & Zingales, L. (2004)	n.d
World Tax Journal Fuest, C., Spengel, C., Finke, K., Heckemeyer, J. H., & Nusser, H. (2013)	n.d

International Research Journal of Business Studies n.d

Masripah, Diyanty, V., & Fitriasari, D. (2016)

Journal of Indonesian Economy and Business n.d

Sari, D. K., Utama, S., & Rossieta, H. (2017)

EFA 2003 Annual Conference Thesis (No. 549) n.d

Jian, M. & Wong, T. J. (2005)

Publish what you pay Indonesia n.d

Saputra, W., & Abdullah, M. (2015)

European Journal of Business and Management n.d

Sivathaasan, N. (2013)

Centre for Research on Multinational Corporations

Dijk van, M., Weyzig, F., & Murphy, R. (2006)

Profundo

Gelder, J.W. van, J. de Wilde, J. van Koningsveld and J. Ferwerda (2016)

PwC Indonesia

Winzenried et al. (2018)

Pearson New International Edition

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2014)

Unpublished Working Thesis

Desai, M., Dyck, A., & Zingales, L. (2003)

Pilos, N. Van Der. (2017)

Pindado, J., Requejo, I., & de la Torre, C. (2008)

Ruiter, R. (2017)