Erasmus University Rotterdam

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Corporate Tax Avoidance

The Determinants and Impact of Corporate Governance

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Master Thesis Accounting, Auditing and Control

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Abstract

This thesis examines the association between degree of firm's tax avoidance and its determinants. Then, it investigates the moderating effect of corporate governance on that relation. Using panel data of public U.S. companies from 2000 to 2015, I find that three firm characteristics: firm size, financing structure, and capital intensity, significantly correlate with effective tax rates. Firm size has a positive correlation with effective tax rates, while financing leverage and capital intensity shows an inverse association with effective tax rates. These findings imply that higher companies avoid less corporate income tax than small corporations. On the other hand, a company with higher long-term debt and tangible assets have more chance to minimize their tax burden. However, this thesis fails to find significant results regarding moderating effect of corporate governance on those correlations even though after employing various governance measures.

Keywords: *tax avoidance, effective tax rates, firm characteristics, firm size, financing leverage, capital intensity, corporate governance*

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Hidayat

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Chapter 1
Introduction

Tax is a critical point of interest for business, government, and society. With the final goal is to maximize firms' profit, managers naturally will try to decrease corporate tax obligations through tax planning even though this activity could be costly on several margins (Desai and Dharmapala 2009). On the other hand, since the tax is commonly a primary source of revenue for government spending and a tool to distribute welfare among the people, tax authorities take much effort to minimize tax avoidance.

Globalization in the current business world drives tax avoidance to be more complex and sophisticated. Consequently, many countries view tax avoidance as a serious problem and improve their fiscal policy to address this issue. In 2013, The Organisation for Economic Co-operation and Development (OECD) and G-20 countries started implementing a new regulatory framework to deal with an aggressive tax planning called base erosion profit shifting (OECD 2013). Moreover, global awareness about tax avoidance has elevated following the Panama Papers publication which leaks more than 11 million files from an offshore law firm in Panama (Harding 2016).

Furthermore, for the reason of economic development, some countries might give favorable tax policies for multinational companies, with incoming of direct investment from those enterprises as the bargain. As this practice relates to another country's revenue, it obviously raises an economic and political tension. The dispute in the European Union (EU) regarding tax rulings and competition climate is an example. Under the European competition law, since 2013 the European Commission has investigated several the EU members tax rulings that caused unfair competition and gave an advantage to some companies. In October 2015, the Commission “punished” Luxembourg and the Netherlands for granting particular tax benefits to Fiat and Starbucks. One year later, the Commission stated that Ireland offered the Apple Inc., a special treatment that gives tax benefit from 2003 to 2014. As a consequence, the Commission has ordered those member countries to issue huge additional bills to the companies. This decision caused political debate not only among the EU members but also including the U.S. government, companies, and society since the matter relates to multi-jurisdictions tax avoidance issue and national economic development.

Complexity in tax avoidance results in the adoption of various approaches by governments based on their legal framework. Common law countries implement the substance-over-form

doctrine, civil law countries enforce an abuse of law rule, while other nations utilize hybrid approach (Avi-Yonah et. al. 2011). The general substance over form principles is adopted to help courts decided whether business arrangement meets the textual and contextual of a rule conferring tax benefits. On the other hand, the general anti-avoidance rules (GAAR) and targeted anti-avoidance rules (TAAR) are implemented to guide tax authorities in handling tax minimizing schemes and transactions (Brown 2012). Furthermore, academic scholars emphasize other several measures such as increasing transparency on country-by-country reporting regime or endorse the treatment of multinational company as one single entity as means to handle international tax avoidance.

While the discussion above mainly focuses on regulation, principles, and efforts of tax authorities, it is interesting to examine the role of shareholders monitoring on the tax avoidance activities. Because tax avoidance increases the bottom line of firm's performance, shareholders may put less attention on tax management activities. However, as indicated by Apple or Starbucks cases, tax avoidance at the same time also raises financial and reputational risks to the companies. For instance, tax avoidance could be requiring international business operations, consuming high legal cost, and increasing reputational risk. Thus, corporate governance as control mechanisms of shareholders' interest, might play a major role in monitoring the degree of firms' tax avoidance.

This research tries to empirically examine the influence of corporate governance on the relation between tax avoidance and firm characteristics as its determinants. Results of this study are analyzed to answer the following research question:

"Does corporate governance moderate the correlation between firm characteristics and corporate tax avoidance?"

To answer that question, I firstly investigate several determinant factors of tax avoidance variability among the U.S. companies in the period of 2000 to 2015. Particularly, the first step of the analysis is examining the correlation between firm characteristics and tax avoidance measures. Next, the study continues with analysis impact of various corporate governance proxies on the relationship.

Empirical results of the OLS regression are consistent with findings of the previous studies on the subject of tax avoidance determinants. I find that three characteristics of firms: size, leverage, and capital intensity are significantly correlated with the extent of tax avoidance. Total asset of companies is positively associated with effective tax rates implying that firms which have larger asset show less degree of tax avoidance. This finding can be explained by the political cost theory. On the other hand, financial leverage and capital intensity show an inverse

correlation with effective tax rates suggesting that corporations might employ interest expense and depreciation of tangible asset as means of tax avoidance. These results are consistent with hypotheses. However, this thesis finds an insignificant impact of corporate governance on the association between firm characteristics and tax avoidance. This finding amplifies several prior studies that indicate the small impact of corporate governance on tax avoidance.

The results of this thesis should be relevance to academic and business world. First, this study extends the prior studies on the subject of tax avoidance determinants. While previous research has analyzed the determinants of tax avoidance variability, this paper enhances these studies by examining a relatively longer period of observations. Moreover, to my knowledge, this thesis is the first empirical study that examines the moderating effect of corporate governance on the association between tax avoidance and the determinants. Also, this thesis should be relevance to investors or shareholders. Since corporate governance is relating to the creation of firm value, examining the moderating effect of corporate governance, in the context of determination tax avoidance degree, can give insight to shareholders about how high impact of their control on tax planning activities by managers.

The remainder of this thesis proceeds as follows. Chapter 2 discusses theoretical background for the relation between firm characteristics, tax avoidance, and corporate governance. Chapter 3 presents an overview of empirical literature relating to this study and then following by hypotheses development in Chapter 4. Sample and research methodology are described in Chapter 5. Chapter 6 reports the empirical results, analysis, and discussion regarding findings of prior research. Finally, Chapter 7 provides concluding remarks.

Chapter 2
Theoretical Review

This chapter describes several theories that explain the relation between tax avoidance, firm characteristics and corporate governance. First, I will explain the agency theory since it is a dominant economic theory that broadly used in accounting research. Next, I will explain the stakeholder theory to give wider perspective about the relationship between variables. Finally, I will discuss the political power and political cost theories that commonly used in tax avoidance literature.

2.1. Agency theory

The agency theory explains the relationship between principal and agent. In general, the principal is a party who has resources such as money, wealth, or fixed asset but has no enough time to manage and develop them. Therefore, the principal will assign another party, called agent, to manage and grow the resources by delegating some decision-making authority to the agent. One of the primary examples of this principal-agent relation was a sharecropping contract between the landowner as the principal and the tenant farmer as the agent. In the modern business context, shareholders of companies can be seen as the principal and the chief executive officer as the agent.

Basically, the principal wishes the agent will do actions that following their interest, for example, increase their wealth. However, based on *homo economicus* idea, the agent will not consistently act in the best interest of the principal because at the same time they have incentives to extract private interest (goal incongruence). It creates a conflict of interest among the principal and the agent known as the agency problem.

In corporations, the agency problem related to the separation of ownership and control between shareholders and top managers (Jensen and Meckling, 1976). To reduce this issue, the principal can minimize divergence of his interest by proposing sufficient incentive to the agent and by incurring monitoring costs designed to limit rent extraction by the agent. Moreover, the principal can also pay the agent to use of resources as a guarantee that the agent will not do actions that would harm the principal interest or ensure that the principal will be compensated if the agent does take such actions (bonding costs). Another cost of the agency problem is the reduction in principal's welfare due to the problem. Sum of all these costs called agency costs.

The principal-agent problem in firms is not only raised by goal incongruence between shareholders and managers but also because of information asymmetry. Since the managers have more knowledge and information about the company than shareholders, it is easier for them to do actions that not align with shareholders' interest. Information asymmetry also restricts the shareholders to monitor managers effectively. Since the agent has too much information and shareholders run inadequate monitoring, this situation might lead moral hazard for the agent to maximize their utility.

Corporate governance arises to deal with this agency problem on companies. Corporate governance is mechanisms used by shareholders to ensure that they get a return on their investment. There are internal and external mechanisms that available to help shareholders aligning managers' interest with theirs (Walsh and Seward 1990). Optimum executives compensation design within equity-based incentives, and effective monitoring by the board of directors are two examples of internal mechanisms. External governance mechanisms relate to ownership structure and market control such as merger and acquisition.

From the agency theory perspective, tax avoidance intuitively can be seen as an activity that pro-shareholder. It is in line with managers interest because it will result in a better bottom line of firm performance. However, Desai and Dharmapala (2006) proposed an idea that tax avoidance and rent extraction by managers might be complementary. This argumentation is based on an argument that managers can utilize tax avoidance as a tool to extract private interest (earning manipulation) if it decreases firms transparency and finally might cause harmful effects to investors.

Moreover, Armstrong et. al. (2015) proposed another explanation about how the position of tax avoidance in companies from agency theory framework. They view tax avoidance as one of risky investment choices by managements. Unresolved agency problems in the firm lead managers to choose the degree of tax avoidance that is not accordance with shareholders' interest. Thus, higher agency problems because of weak governance mechanisms can cause a riskier tax avoidance activity.

2.2. Stakeholder theory

While agency theory put emphasize on the maximization of shareholders' interest e.g. investment return, the stakeholder theory views corporation as a business entity that has responsibility and fiduciary to many other parties (stakeholders) such as employees, customers, suppliers, government, and society. The stakeholder theory has developed to address problems in the business world regarding (i) value creation and trade; (ii) the relation between ethics,

responsibility, and sustainability with capitalism; and (iii) what it takes to succeed in the business. It argues that to be successful in business, managers should have an understanding of behaviors, values, and backgrounds of stakeholders including the societal context. Moreover, managers also have to analyze how stakeholder relationships run at three levels: the rational level or organization as a whole, the process level (standard operating procedures), and the transactional level or day-to-day bargaining. Shortly, managers need to make sure that stakeholder interests are balanced (Freeman 2010).

Donaldson and Preston (1995) stated three important aspects of the stakeholder theory: descriptive or empirical, instrumental, and normative. The stakeholder theory is descriptive by presenting a model describing what the firm is. It describes the corporation as a configuration of cooperative and competitive interests holding intrinsic value. The theory is also instrumental since it is establishing a framework for examining the relations between the stakeholder management practices and the achievement of corporate goals. However, the fundamental basis of the stakeholder theory is normative because it is based on an idea that stakeholders are persons or groups with legitimate interests which bear intrinsic value. Thus, each group stakeholders justifies recognition for its own sake, not because of its ability to pursue other group's interests, for example, the shareholders.

From the stakeholder theory perspective, firms look for legitimization for their business activities from different stakeholder groups which have a different influencing power within society, for example, governmental bodies, trade unions, and communities (Lanis and Richardson, 2011). The firm can gain legitimacy from these groups by running its activities in a socially responsible manner. Therefore, the corporation can gain legitimacy from society and governmental bodies by carrying out business activities that comply with laws and their underlying spirit. Complying with the tax law and its underlying spirit is an essential part of this legitimacy seeking.

2.3. Political power theory

Salamon and Siegfried (1977) suggested that economic power has an influence on the political process. The article proposed two important factors that shape the degree of economic sector impact on public policy: the characteristics of the political system and the structure of economic. The political regime (in the US) gives easy access to the public in the policy-making process through voting, congressional testimony, and campaign finance. Theoretically, it will increase the possibility of public control on public policy. However, at the same time, this condition raises the possibility of the conversion of asymmetry economic power into

asymmetry political power. Several factors facilitate this transformation. First, the disparity of incentives and resources for political actions among citizens. Individual consumer tax-payer such as small firms have relatively lower incentives, and resources to be involved in public policy making compare to large corporations. Next, the fragmentation of the policy-making process through separated institutions or agencies. These agencies rely on the Congress which has fragmented-power for their funds and authority support. Finally, the predominance of the executive over the legislative in the political decision-making process. Executive or administrative agencies involved in the massive production of law compared to legislative and judiciary.

Besides the nature of the political system, the economic structure also affects the degree of economic impact on political power. Salamon and Siegfried (1977) identified five aspects of economic structure that affect political influence: firm size, industry size, market concentration, profit rate and degree of geographical dispersion. Big corporations not only have greater incentives to participate in politics but also have larger resources to be involved in the political process either directly such as campaign funding or indirectly through purchasing expertise to support their position in decision-making. Moreover, bigger industry have greater political influence because they have larger pools of funds, expertise, client support, employees, and other resources than smaller industries.

Market concentration also influences the degree of political influence because a highly concentrated market can generate more profit and avoid the time-consuming process of negotiating industry positions on policy matters than broadly disperse competing firms. Next, the profitability of companies also has impact independently on the political influence because it raises the availability of resources necessary for political power. Besides, highly profitable companies have more incentives to alter the policies that put a larger burden on high-profit firms such as the federal income tax. Finally, the degree of geographical dispersion is critical because, for a given company and industry size, industries will be more successful in attracting political attention to the extent that they are geographically concentrated.

All these characteristics cause companies with greater economic power such as larger corporation or firms in more major industries have more political influence. If this economic power used to affect the decision-making process of tax policy, the businesses could avoid tax burden more efficiently than smaller firms.

2.4. Political cost theory

In contrast to the political power theory, the political cost theory argues that the political sector has an impact on private-sector's wealth (Watts and Zimmerman 1978). The government has the power to alter wealth distribution among various groups, and the corporate sector is exceptionally vulnerable to this wealth distribution. Firms can utilize several mechanisms such as media campaign of corporate social responsibility, political lobby or earning management through accounting procedures to decrease reported earnings to address this possibility. These activities are expected can minimize the possibility of adverse political actions from government and its cost such as legal fees.

Moreover, the degree of political cost to the corporation is highly related to firm size. This argument is based on hypothesis that expects larger companies to be subjects of greater government scrutiny than smaller companies (Jensen and Meckling 1978). Furthermore, the political cost theory views corporate taxes as a component of political costs (Zimmerman, 1983). Thus, because of larger firms face higher political cost, they will endure higher taxes. It can be reflected in higher effective tax rates of bigger companies.

Chapter 3
Literature Review

This chapter provides a summary of the academic literature on tax avoidance. Specifically, this part discusses general ideas of studies on tax avoidance from three related points: the determinants of its variability especially firm-level characteristics, the impacts of this activity, and the effects of corporate governance on the degree of tax avoidance.

3.1. Determinants of tax avoidance variability

Many researchers have analyzed aspects especially firm-level characteristics that might be crucial determinants of variability in tax avoidance activity level. These characteristics specifically financial indicators such as firm size, leverage level, and capital intensity have been indicated correlate with tax avoidance activity which mainly measured by the effective tax rate. In general, research findings in this topic show a similar pattern of relationship. Only the correlation between effective tax rates and firm size show mixed results.

Salamon and Siegfried (1977) analyzed propositions of the political power ideas empirically. It studied the relations between economic structures and political influence. The research proposed an idea that the political power as indicated by tax avoidance rate (statutory tax rate minus effective tax rate) is a function of several economic structures namely firm size, industry size, market concentration, profitability rate, and geographic concentration. The regression findings of this research indicated that firm size has a positive correlation with tax avoidance rate while the coefficients of other variables show negative correlations with the rate. These results suggest that the larger corporations generate greater political power than small firms. On the other hand, more major industries are less successful in influencing political process as predicted by the "free rider" hypothesis. However, results of this research cannot be generalized extensively since the study only analyzed a small number of samples.

Stickney and McGee (1982) investigated the relationship between effective corporate tax rates of major U.S. firms with the company size, the degree of capital intensity, the extent of international operations, business operations in natural resources, and degree of leverage. The researchers hypothesized that there is an inverse relation between effective tax rate and those variables. By comparing the difference of effective tax rate between six clusters of the explanatory variables (cluster analysis), the researchers found that capital intensity, leverage,

and natural resource involvement seem to play important roles in differences in effective tax rates among sample firms. On the other hand, foreign involvement and size play less important roles in distinguishing companies' effective tax rates. The researchers suggest that the negative relation between effective tax rate and capital intensity caused by accelerated depreciation and investment credits, while the effective tax rates of the metals mining companies were reduced because of percentage depletion, and the timber companies enjoyed lower tax because of the capital gains taxation of the sale of timber. Similar to capital intensity, leverage also played an essential role in explaining differences in effective tax rates.

More particular, Zimmerman (1983) examined the association between a single firm characteristic; firm size, and effective tax rates with industry classification as a control variable. The article is based on political cost hypothesis which views corporate tax as a part political costs of companies, and larger firms will have higher effective tax rates. The study result that suggesting the largest firms have the highest effective tax rates in most industries confirms this hypothesis. Moreover, further analysis revealed that the pattern of this correlation is not monotonic. The study concluded that industry type has a significant effect on this association. The oil and gas industry has the strongest relationship, while the manufacturing sector a weaker. In contrast, the wholesale and retail trade industry shows the opposite pattern. The large commerce firms have lower effective tax rates than small trade companies. Furthermore, the researcher conducted several additional tests to ensure the results are robust by examining alternative tax rates and firm size measures and by using different sources of data. The researcher also discussed possible reasons for the results: fixed tax shield, good performance/diversification, elimination of the oil depletion allowance, and foreign taxes. In general, findings of these tests and the discussions support the initial results.

Contrast to Zimmerman (1983), Porcano (1986) found that the relation between firm size and effective tax rates is negative. In general, Porcano (1986) investigated the overall structure of the U.S. corporate income taxes. In the article, the researcher found that the average of U.S. companies effective tax rates in 1982 and 1983 were relatively small. The paper also concluded that for those two years, the largest firms had the least average effective tax rates, and the smallest companies had the largest rates. In other words, the average effective rates on U.S. income essentially has an inverse relation to firm size. Consequently, it suggests that the corporate income tax in the U.S. was practically regressive even though the statutory rate of corporate income tax is progressive. Two possible reasons for this regressive pattern are depreciation deductions and tax credits. The largest firms received greater relative deductions

from depreciation than other corporations. Additionally, total tax credits are significantly bigger for the most major companies than for the other.

Using longitudinal (panel) data, fixed-effect regression model, and comparison of two tax regimes, Gupta and Newberry (1997) offers more advanced analysis on the determinants of tax avoidance compared to the prior research. The article examined the determinants of variability in corporate income tax rates, especially company size, capital structure, asset mix, and performance. The regression result shows an inconsistent correlation between firm size and effective tax rates. Before Tax Reform Act 1986, the relationship was significantly positive while after the Reform, the relation is significantly negative. The researchers argue that the effective tax rates-firm size correlation is sensitive to sample composition, regarding the vast disparity in the prior research results. Also, the researchers concluded that there is no link between effective tax rates and firm size if it is examined over time with firms which have mature age, but the correlation will be significant if the variables are analyzed using companies with shorter histories.

Moreover, the article also stated that effective tax rates are related to the capital structure, but the correlation is sensitive to the measurement of income on effective tax rates. The paper also suggests that the effective tax rates have a strong correlation to asset mix. These results indicate that firms with a larger proportion of capital tend to have lower effective tax rates as a result of tax preferences, whereas companies with a greater proportion of inventory (which do not have those tax shields) tend to have higher effective tax rates. Next, the results also imply the importance of changes in a firm's income as a control variable in the regression model of effective tax rates. Finally, the article concluded that average effective tax rates increased after Tax Reform Act 1986 and the effective tax rates have continued to be correlated with the firm-specific characteristics after controlling tax reform variable.

While previous studies only focused on industrialized countries especially the U.S., Kim and Limpaphayom (1998) examined the relationship between several firm characteristics (firm size, leverage level, profitability, and growth) with effective tax rates of companies located in Pacific Basin Area. Using quantile time series analysis and the regression model, the researchers found that firm size has a negative association with effective tax rates, but this relationship is sensitive to the calculation method of effective tax rates. Kim and Limpaphayom (1998) suggested that effective tax rates measurement by Zimmerman (1983) performs better than measurement of it by Porcano (1986). Next, the researchers concluded that profitability is a significant factor that determines the level of effective tax rates. However, neither leverage nor growth shows a strong correlation. The reason why the results show insignificant

coefficients is not because leverage is an unimportant tax shield since long-term debt is not widely used in these countries. It is usual practice for firms in this region is to arrange short-term loans with local financial institutions and roll-over those liabilities. Several limitations of this paper are the calculation of effective tax rates from financial statements may not be appropriate because it is noisy, an alternative tax measure may yield different findings, and the analysis ignores industry effect.

Rego (2003) also investigated firm-level characteristics that might affect the variability of tax avoidance. The researcher investigated possibility economies of scale such that larger, more profitable, and multinational corporations exist for tax avoidance, resulting in lower effective tax rates. The researcher predicts that firms which have a larger size, bigger pretax income, and more extensive foreign operations will have lower global effective tax rates because they have more opportunities to avoid income taxes. However, the finding of this paper does not support this hypothesis because the result suggested that larger companies have higher worldwide effective tax rates. Thus, it confirms political cost theory as mentioned in Zimmerman (1986). On the other hand, the other findings that suggest firms with greater income and more extensive foreign operations have lower worldwide effective tax rates are in line with the researcher's prediction.

Similar to Kim and Limpaphayom (1998), Richardson and Lanis (2007) also investigated the determinants of variability in corporate effective tax rates in the outside U.S. environment. Using The Ralph Review tax reform in 2000, the researchers studied the impact of firm size, capital structure (leverage) and asset mix (capital intensity, inventory intensity, and R&D intensity) on the effective tax rates of the Australian firms. The authors predict that all these characteristics, but inventory intensity, are negatively associated with effective tax rates while inventory intensity will show a positive correlation with the rates. Regarding, the Ralph Review tax reform, the researchers also hypothesized that this tax reform moment is inversely correlated with effective tax rates and has a moderating impact on the previous association.

The researchers documented regression results that support above hypotheses. They concluded that there is a significant negative association between effective tax rates and several firm characteristics such as size, the capital structure for leverage, capital intensity and R&D intensity. The effective tax rates also show a significant positive correlation with inventory intensity as expected. Also, the regression analysis indicates the important impact of the Ralph Review tax reform on the effective tax rates and the reform also moderates the association of the rates with capital structure and inventory intensity. Homogeneous sample, measurement of

effective tax rates using financial statement data, and omitted variables on regression model are identified limitations of this paper.

While previous literature mainly relies on firm-level characteristics within a single tax jurisdiction, other studies also identify country-level features that affect tax planning behavior. Atwood et. al. (2012) examines the impact of three indicators of tax system characteristics; (a) required book-tax conformity, (b) worldwide versus regional approach, and (c) the perceived strength of tax enforcement, on corporate tax avoidance across different countries. The paper also examines the moderating impact of the variable component of managers' compensation on these correlations. The empirical analyses reveal that, on average, tax avoidance level is lower for companies in home countries with higher required book-tax conformity, a global (rather than domestic) approach, and a stronger perception of tax enforcement. Next, the authors also found that higher variable portion of management compensation affected the association between tax avoidance. It also causes the relation of required book-tax conformity and the perceived strength of tax enforcement with tax avoidance to be less negative. Finally, the article concluded that the association between worldwide tax approach and tax avoidance only exist when the variable portion of management compensation is small. Results of this paper indicate that increasing tax enforcement is likely to minimize tax avoidance and increasing book-tax conformity is unlikely effective to address tax avoidance unless managers' variable compensation is also lowered.

3.2. Impacts of tax avoidance

Some scholars put their attention on the implications of tax planning activity by managers to the firms. This sub-section will discuss a summary of some academics articles that studying this topic. In general, these studies predict that tax avoidance will give effect to the value of firms, the cost of equity, and risk of the companies.

Desai and Dharmapala (2009) investigates the degree of corporate tax avoidance activity is valued by shareholders in U.S. companies. Specifically, this paper examines the correlation between tax avoidance activities by managers with firm's value. The researchers summarize alternative theories that explain tax avoidance. Tax avoidance is purely tax-saving devices without agency dimension, and it can create a managerial shield for opportunism (agency problem). Thus, as a mechanism to mitigate agency problem, this paper predicted that corporate governance has a moderating impact on the correlation. The OLS regression results suggest that the effect of tax avoidance (book-tax gap) to firm value (Tobin's Q) is positive but insignificant. Further analysis reveals that this association is stronger in companies with higher governance

indicator (institutional ownership). The researchers admitted that these results are complicated to interpret because of the possibility of error in tax avoidance measurement and the endogeneity issue. To address this problem, the authors used new tax rules in the US (1997 the check-the-box regulations) as the instrumental variable. By using this instrumental variable, the researchers have an exogenous event that mitigates endogeneity issue and able to investigate the causal effect. The instrumental variable examination resulted in similar and stronger correlation than the initial results.

Goh et. al. (2016) is another study that examines the impact of tax avoidance on the firm characteristics specifically on the level of the cost of equity. The researchers argue that tax avoidance has an influence on the cost of capital by affecting three aspects. First, the firm's expected future cash flow. Next, it may influence the variance of the company's cash flows. Lastly, it can affect the covariance of the firm's cash flow with the sum of all cash flows in the market. Theoretically, tax avoidance can increase expected future cash flows and reduce the cost of equity by making cash tax savings. However, tax avoidance also can increase the variance and covariance of the firm's cash flows, which is increasing the cost of equity capital.

The researchers hypothesized that the cost of equity capital is negatively correlated with tax avoidance. Then, the paper also predicts that better external monitoring, higher marginal benefits from tax savings, and higher information quality will make this correlation stronger. Consistent with these predictions, the regression analysis shows that there is a negative correlation between the cost of equity and tax avoidance (book-tax differences, permanent book-tax differences, and long-run cash effective tax rates). This association is stronger for firms with better external monitoring, with higher marginal benefits from tax savings, and with higher information quality. These findings potentially explain why many large U.S. corporations engage in tax planning and provide incentives for managers to engage in tax planning.

Finally, Guenther et. al. (2017) analyzed the relation between tax avoidance with firm risk. In detail, this paper examines three research questions. First, whether low tax rates are less persistent than high tax rates. Second, whether low effective tax rates are related to larger future tax rate volatility. Finally, the paper examines whether low tax rates have a correlation with the higher uncertainty of firm's future cash flows. By using quantiles regression of tax avoidance, the researchers found that the probability of companies in the lowest effective tax rates quantile remaining in this quantile is higher than the likelihood of firms in other quantiles remaining in the same quantile. It means low tax rates tend to be more persistent than higher tax rates. Next, the results for second research question is cash effective tax rates are positively associated with

future tax rate volatility. However, this association is not significant. This finding does not support the prediction that tax avoidance activities (lower a firm's effective tax rate) have a connection with a greater degree of risk. A similar condition is also found in the analysis of research question three. The researcher found an insignificant relation between tax avoidance measurements and future stock return volatility. In contrast, the researcher found a significant relationship between volatility in cash effective tax rates and future firm risk. Shortly, this article documented insignificant relation between tax avoidance and firm's risk. However, the results confirm that the volatility of the company's cash effective tax rates serves as a leading indicator of future firm risk.

3.3. Tax avoidance and corporate governance

Since Enron and Worldcom scandals, the public has become more aware of the importance of good corporate governance. There are several aspects which affect the quality of corporate governance such as shareholders or ownership structure, a board of directors monitoring, executive compensation, and a legal system. Several studies have examined the link between these aspects and the degree of tax avoidance.

Many studies have analyzed the link between executive compensation and the extent of tax avoidance. First, Philips (2003) investigated the relationship between compensation design of high-level managers (chief executive officers) and middle-level managers (business unit managers) that include after-tax accounting-based performance indicators leads to lower effective tax rates. The author hypothesized that using after-tax performance measure in the compensation plan of CEO and business unit manager leads to lower effective tax rates. By examining the OLS regression model using proprietary survey data, the author documents an insignificant correlation between CEO's bonus plan with after-tax performance measures and lower effective tax rates. In contrast, the empirical coefficient reveals that the negative association between the using of after-tax performance indicator in business unit managers' compensation plan and lower effective tax rates is statistically significant. These findings suggest that rather than increasing own wealth, other incentives such as job retention might motivate CEOs to focus on after-tax results, whereas annual after-tax bonuses provide motivation only for business unit managers to consider tax impact of their decisions. Potential omitted variables and the validity of effective tax rates as a tax planning measurement are limitations of this paper.

Similar to Philip (2003) that examines the connection between tax avoidance and executive compensation design, Desai and Dharmapala (2006) also investigated the link between tax

sheltering and executive compensation design that gives high power to CEO. Interestingly, in contrast to the traditional agency perspective, the authors argue that feedback effects or complementarities between diversion of rents and tax sheltering cause higher-powered incentives might reduce the degree of tax sheltering. The paper also predicted that the quality of corporate governance affects this relation. Tax sheltering activity is identified by the residual value of book-tax gap, and the level of governance is measured by the anti-takeover index and the fraction of institutional investors ownership. The empirical analysis documented a conclusion that increases in incentive compensation tend to reduce the level of tax sheltering. This result is consistent with the idea that tax sheltering and rents diversion are complementary. Next, the paper also suggested that the negative association between tax sheltering and executive compensation is mediated by the characteristics of corporate governance.

Minnick and Noga (2010) also studied the relation between several governance mechanisms and long-run tax management. Based on the notion that effective tax management is a long-term goal, this article expects that firms with higher incentive compensation will invest more resources in tax management. Therefore, this paper hypothesized that increased sensitivity of pay-performance for the CEO and directors would result in lower taxes. The article also predicts that tax management is affected by external governance mechanism. Thus, it hypothesized that increased quality of external governance mechanisms would result in lower taxes. Empirical results of the paper indicated that pay-performance sensitivity, especially for executives, provides longer incentive horizons for executives and directors to reduce long-run taxes while other external corporate governance mechanisms do not show a significant correlation with long-run tax management. Moreover, the paper also documented an important role of governance in tax management. Further analysis of tax management reveals that companies with different governance structures choose different tax management strategies.

While previous literature put a high interest of tax avoidance and governance on executive compensation, Lanis and Richardson (2011) focuses on another important governance mechanism: a board composition. The researchers predict that more effective board monitoring with more number of outside directors will reduce the likelihood of tax aggressiveness. The sample of this study is a matched data of Australian firms that were involved in cases of tax aggressiveness and companies that were not involved in tax avoidance cases. The results of the logit regression support the hypothesis by documenting a negative and statistically significant coefficient between board composition and tax aggressiveness. This result is consistent with other measures of board composition, different sample number and different tax aggressiveness proxy. Several limitations of this study are the sample only contains public corporations, the

total number of tax aggressiveness is small, relatively low generalizability and potential misclassification of non-tax-aggressiveness corporations.

Another research that examines the correlation between managerial incentive and the degree of tax avoidance is Armstrong et. al. (2015). Additionally, this paper also investigated the impact of governance mechanism in particular board monitoring indicated by financial expertise and independence on the correlation. The researchers hypothesize that managers expect greater personal benefits from increased tax avoidance, and better boards' control mitigate agency problems related to extreme levels of tax aggressiveness. The empirical results of quantile regression suggest that managerial compensation with risk-taking equity incentives have a positive correlation with tax avoidance and this relation is stronger in the right tail of the tax avoidance distribution. Another important finding of this paper is financial expertise and independence on the board of directors show a positive (negative) association with tax avoidance in the left (right) tail of the tax avoidance distribution. The paper indicates that tax avoidance is similar to other investments that entail a risk-return trade off and the optimal level of tax avoidance is more likely to occur at an interior point at which the marginal costs of this activity are close to the benefits.

Another important mechanism of corporate governance is ownership structure. Regarding this topic, several studies have focused on the relation between ownership structure and tax avoidance. Badertscher et. al. (2010) investigated the role of ownership by private equity firms to the tax planning of acquired companies (portfolio firms). Based on argumentation that private equity firms monitor and control over portfolio firms, tax practices of private equity firms are likely influencing the tax practices of their portfolio firms. By comparing private equity-backed firms to other privately-held firms, the researchers examine the research question whether private equity-backed companies engage in more or less tax avoidance than other private companies. Empirical results of this study suggest that compared to other private firms, private equity-backed firms engage in significantly more non-conforming tax planning and have lower marginal tax rates. The author also concluded that portfolio firms which are owned by the majority or larger private-equity firms engage in more tax avoidance than portfolio firms which are owned by minority or smaller private-equity firms. A possible explanation for this outcome is the private-equity companies have resources and expertise to promote greater tax avoidance at portfolio companies, and this effect is more prevalent for portfolio firms that are either majority-owned or owned by larger private-equity companies. Another reason is the benefits of tax planning outweighing the associated costs for private equity portfolio companies.

Badertscher et. al. (2013) also investigated the impact of ownership and control structure on corporate tax avoidance. The researchers compare tax avoidance difference of management-owned companies and private equity-backed private companies. The study hypothesizes that compared to the private equity-backed firms, the management owned firms do less tax avoidance because they have more concentrated ownership and control. This hypothesis is based on agency theory that argues managers as the owner will likely be more risk averse and thus less willing to invest in risky projects such as tax avoidance. Consistent with this prediction, the paper documented a significant correlation between management-owned firms and various tax avoidance measures. It suggests that management-owned firms avoid less income tax than private equity-backed companies. As a robustness test, the paper also examines several subsets of the sample to check various measurements of ownership structures, for example, management-owned firms compared to employee-owned companies. Results of these additional tests are substantially similar to initial findings. The authors conclude that marginal costs of tax planning explain this relation.

Moreover, several scholars also put attention the link between tax avoidance and business ownership when government involves in the private business. Chan e.t al. (2013) investigates the impact of government ownership and corporate governance on firm's tax aggressiveness. The sample is Chinese listed companies which many of their ultimate shareholders is the Chinese government. Since managers of government-controlled companies are part of government bureaucracy, the study expects that the political objectives of protecting public revenues should dominate in a government-controlled firm's tax reporting strategy. Consequently, government-controlled firms are less tax aggressive compared to non-government-controlled corporations. Also, regarding the impact of corporate governance, the paper hypothesized that difference in percentages of independent directors on board results in a difference in tax aggressiveness, and firms with CEO duality and the higher percentage of board shareholdings are more tax aggressive. Results of Tobit regression in this paper show a positive correlation between the ratio of effective tax rates and dummy variable of government-controlled firms. It indicates that managers in government-controlled firms are less tax aggressive. CEO duality and the higher percentage of board shareholding show a significant negative correlation with tax avoidance indicator; thus it is confirming the hypothesis.

Similar results also documented by Bradshaw et. al. (2016) which examines the effect of state ownership on corporate tax avoidance behavior. The researchers predict that managers in state-owned enterprises make tax planning that favorable to the state but costly to minority shareholders which imply they will engage less tax avoidance and have higher effective tax

rates. Next, this paper also considers the fact that managers of state-owned enterprises are part of government bureaucrats and bureaucratic promotion can affect tax behavior. Thus, the paper hypothesized that the probability of promotion would be positively associated with effective tax rates. Empirical results of this article support all these predictions by documented a positive correlation between effective tax rates and dummy variable of state-owned enterprises and probability of promotion. Also, further analysis finds that the local state-owned enterprises seem to be more discourage tax avoidance compare to central state-owned enterprises. A positive coefficient is also shown by the regression of managers' promotion probability and effective tax rates. Lastly, the authors also find that year of performance evaluation also has an impact on tax behavior because the coefficient of correlation between these two variables is positive. These findings are robust to several additional tests.

McGuire et. al. (2014) examines a research question: whether difference in dual class (inferior and superior) stock ownership is related to firms' tax planning. The inferior class of stock is publicly traded stock and has a single vote per share. The superior class of stock, usually owned by insiders, is typically not traded publicly stock and has multiple votes per share. This dual class creates agency conflict, and the costs of this conflict might give impact on the level of firms' tax planning. The authors predict that managers in dual-class firms might engage less tax avoidance because tax-avoidance activities are costly to managers and outside shareholders have restricted ability to compel dual-class managers. However, the association of dual class firms and tax avoidance could be positive because cash savings resulted from the tax avoidance activity are insulated from the pro rata shareholder wealth consequences and the complexity of tax avoidance allows managers to conceal rent extraction. This study documented a positive and significant association between effective tax rates and dual-class firms. It suggests that managers in dual-class firms engage lower tax avoidance compared to single-class companies. Further analysis suggests that this association is mainly driven by managerial entrenchment rather than incentives.

3.4. Summary

Corporate tax avoidance, usually represented by the effective tax rate, is an activity used by the companies to minimize their tax liability. A study on the U.S. firms found that the effective tax rate is low and regressive over the long period. Several studies analyze firm characteristics that might affect the variability of tax avoidance. Some financial measurements such as firm size, leverage level, and capital intensity show a high correlation with the effective tax rate. Those economic indicators mainly have a negative association with the effective tax rate.

However, the relationship between firm size and effective tax rate show mixed results. Some articles conclude that firm size has no significant association with tax avoidance while other studies documented a positive association or negative association. Furthermore, another study suggests that the difference in the characteristics of home country tax system also affect corporate tax avoidance. Next, other articles also analyze the impact of tax avoidance on companies. First, the researcher finds that tax avoidance decreases the cost of equity. Another paper documented the insignificant impact of tax avoidance on firm risk. However, the researchers suggest that tax rate volatility is a potentially important indicator of higher overall company risk.

Several scholars consider tax avoidance as a part of agency problems. Thus, according to the agency framework, companies need governance mechanisms such as optimum ownership structure, effective board monitoring, and ideal executive compensation to mitigate this problem. Some articles find that better corporate governance decreases the degree of tax avoidance and others discovered that another corporate governance indicator such as management ownership could trigger more tax avoidance. Good corporate governance also affects the association between tax avoidance and firm value. Focus on the executive compensation, other articles found a positive association between executive compensation and tax avoidance. It is suggesting that management incentive causes more tax avoidance because it is mostly based on after-tax income. Consistent with the previous discussion, other papers also found that other corporate governance mechanisms might lower this effect. Interestingly, another study suggests that the link between management performance measurement and tax avoidance is stronger in business-unit level compared to the executive level.

Regarding the impact of ownership structure on tax avoidance, a study documented a finding that suggests managers in private-equity-backed firms engage more tax avoidance than those in non-private-equity-backed corporations because they have resources and expertise to promote greater tax avoidance at portfolio companies. Finally, some papers argue that government ownership lowers the degree of tax avoidance because managers of state-owned firms have a political objective to protect government revenues. The above discussion of literature in tax avoidance is summarized in the following literature matrix (Table 1).

Table 1 - Literature Matrix

Author	Year	Subject	Variables	Sample & Period	Methodology	Findings
Armstrong, et. al.	2015	Corporate governance, incentives, and tax avoidance	• Dependent variable: *tax position* • Independent variables: *log number of financial experts; proportion of independent directors; natural log of director number; natural log of CEO portfolio Delta; natural log of CEO portfolio Vega* • Control variables: *cash flow from operations divided by average total assets; natural log of the firm's market value of equity; natural log of total foreign assets; revenue-based Herfindahl-Hirschman index*	• 3,137- 4,128 firm- year observations • 2007- 2011	Quantile regressions	• Risk-taking equity incentives are positively related to tax avoidance, and the relationship is stronger in the right tail of the tax avoidance distribution because they potentially motivate managers to invest in risky tax avoidance. • Board financial sophistication and independence exhibit a positive (negative) relation with tax avoidance in the left (right) tail of the tax avoidance distribution. • More financially sophisticated and independent boards mitigate agency problems related to relatively extreme levels of tax aggressiveness.
Atwood, et al.	2012	Home country tax system characteristics and corporate tax avoidance	• Dependent variable: *tax avoidance* • Independent variable: *the level of required book-tax conformity; country dummy variable; managers' perceptions of the strength*	• 69,301 firm-year observations from 22 countries • 1993-2007	OLS regressions analysis	• Firms avoid more taxes when the home country has lower required book-tax conformity, a worldwide approach, and a lower perceived strength of tax enforcement. • The association between tax avoidance and tax system

Author	Year	Subject	Variables	Sample & Period	Methodology	Findings
			of tax enforcement in the country; proportion variable reward of the manager's total compensation; total accrual			characteristics depends on the portion of management compensation that is from variable pay. • The relations between tax avoidance and the tax systems characteristics are not driven solely by accruals management.
Badertscher, et. al.	2010	Impact of private equity ownership on corporate tax planning	• Dependent variable: *total book-tax differences, discretionary permanent book-tax differences, and cash effective tax rates; marginal tax rate* • Independent variables; *dummy variable of private equity company; dummy variable of large firm* • Control variables: *leverage; dummy variable of loss firms; interest expense; intangible assets; equity income; sales growth; abnormal total accruals; ROA*	• 2,615 private firm- year observations from Compustat • 1978-2005	OLS regression analysis	• PE-backed firms engage in significantly more nonconforming tax planning and have lower marginal tax rates than other private firms. • Majority PE-backed firms engage in more tax avoidance than minority PE-backed firms. • PE firms have the resources and expertise to promote greater tax avoidance at portfolio firms, and this effect is magnified for portfolio firms that are either majority-owned or owned by larger PE firms.
Badertscher, et. al.	2013	The separation of ownership and corporate tax avoidance	• Dependent variable: *GAAP effective tax rates, cash effective tax rates; discretionary permanent book-tax difference;tax*	• 2,628 private firm- year observations • 1980-2010	2-SLS regression analysis	• Management-owned companies avoid significantly less tax than PE-backed firms, consistent with the separation of ownership and control having a significant impact on the tax

Author	Year	Subject	Variables	Sample & Period	Methodology	Findings
			sheltering • Independent variables; *dummy variable of management-owned firm* • Control variables: *return on net operating assets; net operating loss carry forwards; leverage ratio; foreign operations; intangible assets; sales growth; firm size; year* and *industry fixed effect*			avoidance practices of private firms. • PE-backed firms can reduce portfolio firms' marginal costs of tax avoidance, resulting in greater tax avoidance than management-owned firms.
Bradshaw, et. al.	2016	Ownership structure and tax avoidance	• Dependent variable: *current effective tax rates, cash effective tax rates* • Independent variable: *dummy variable of state-owned firms* • Control variables: *firm size; ROA; leverage; loss carryover; market to book ratio; capital expenditure; R&D expenditure; ratio of foreign sales; merger and acquisition activities; equity offering; ownership concentration; cross listing; management ownership; CEO-Chair*	• 16,402 firm-year observations of Chinese companies • 1999-2012	OLS regression analysis	• State-owned firms report significantly higher effective tax rates and cash tax rates than non-state owned companies. • The effects of state ownership on reduced tax avoidance are greater for firms controlled by local governments than by those controlled by the central government.

Author	Year	Subject	Variables	Sample & Period	Methodology	Findings
			duality			
Chan, et. al.	2013	Government ownership, corporate governance, and tax aggressiveness	• Dependent variable: *ratio of effective tax rates to applicable tax rate; percentage of independent directors; CEO duality; board shareholdings* • Independent variable: *dummy variable of government ownership* • Control variables: *firm size; leverage; market to book ratio; ROA; assets mix; rights offering; industry and year effect*	• 6,032 firm-year observations of listed Chinese companies • 2003-2009	Double-censored Tobit regression	• Government-controlled firms pursue less aggressive tax strategies because managers of these companies have the political objectives of protecting government revenues, and they push their corporations to avoid aggressive tax planning. • Non-government controlled firms with higher board equity holdings and duality duties performed by the board chairman are more tax aggressive. • Management of non-government controlled firms, particularly those with dominant CEOs, tend to exploit aggressive tax planning.
Desai, M., and Dharmapala, D.	2006	High-powered incentives and tax avoidance	• Dependent variable: *residual book-tax gap* • Independent variables: *ratio CEO stock option grants; G-index; fraction of the firm's shares owned by institutional investors* • Control variables: *year and industry effect*	• 4,192 firm-year observations • 1993-2001	OLS regression analysis	• Incentive compensation appears to be a significant determinant of tax avoidance activity. In particular, higher-powered incentives are associated with lower levels of tax sheltering for the typical firm. • The relation is mediated by firms' governance and does not hold for well-governed firms.

Author	Year	Subject	Variables	Sample & Period	Methodology	Findings
Desai, M., and Dharmapala, D.	2009	Effect of tax avoidance on firm value	• Dependent variable: *Tobin's Q* • Independent variables: *book-tax gap; fraction of the firm's shares owned by institutional investors* • Control variables: *NOL; leverage; foreign income/loss; R&D; year and industry effect*	• 4,492 firm-year observations • 1993-2001	OLS regression analysis	• The overall effect of the proxy for tax avoidance on firm value is positive but insignificant. • Well-governed effect on the relationship between tax avoidance and firm value is positive and significant, but for less well-governed firms, the effect is insignificant. • Higher-quality firm governance leads to a larger effect of tax avoidance on firm value is reinforced by using an exogenous source of variation due to changes in tax regulations to construct instrumental variables for tax avoidance activity
Goh, B. et al.	2016	The effect of corporate tax avoidance on the cost of equity	• Dependent variable: *cost of equity capital* • Independent variables: *tax avoidance (book-tax differences, permanent book-tax differences, and long-run cash effective tax rates); analyst following; percentage of shares held by institutional investors; sales growth; Whited-Wu index;accrual quality; speed of earnings announcement;*	• 26,781 firm-year observations from I/B/E/S, Compustat & CRSP • 1993-2010	OLS regression analysis	• The cost of equity is lower for tax-avoiding firms, even after controlling for the business fundamentals underlying these tax savings transactions. • The positive association between corporate tax avoidance and the cost of equity is stronger for firms with better outside monitoring, higher marginal benefits from tax savings, and higher information quality.

Author	Year	Subject	Variables	Sample & Period	Methodology	Findings
			management forecast accuracy • Control variables: *firm-level controls; year and industry fixed effects*			
Guenther, D., et. al.	2017	Correlation between tax avoidance and firm risk	• Dependent variable: *volatility of stock returns* • Independent variables: *tax avoidance (cash effective tax rate; GAAP effective tax rate; discretionary book-tax differences; dummy variable of tax sheltering; predicted unrecognized tax benefit.* • Control variables: *firm-level controls*	• 4,456 - 32,023 firm-year observations • 1987-2010	• Quantile regression analysis • OLS regression analysis	• There is no supporting finding that a greater degree of tax avoidance is associated with higher and future tax rate or stock return volatility. • Firm's tax rate volatility and overall firm risk are positively correlated, which suggests that tax rate volatility is a potentially important indicator of higher overall firm risk.
Gupta, S. and Newberry, K	1997	Determinants of the variability of corporate effective tax rates	• Dependent variable: *effective tax rates* • Independent variables: *firm size; leverage; capital intensity; investment intensity; R&D; period dummy* • Control variables: *ROA*	• 5,240 firm-years observations • 1982-1985, 1987-1990	OLS regression analysis	• Effective tax rates are positively (negatively) associated with firm size for the period before (after) Tax Reform Act of 1986 (TRA86). • Effective tax rates are negatively associated with firm capital structure (leverage), asset mix and financial performance. • Average ETR increased in the post TRA86 period.
Jensen, M., and	1976	Theory of the firm:	• -	• -	Economic	Separation of ownership and control has agency costs. In case a manager owns

Author	Year	Subject	Variables	Sample & Period	Methodology	Findings
Meckling, W.		managerial behavior, agency costs, and ownership structure			model	100% of the stock, he will act in the way that maximizes firm's wealth. In the case when he doesn't own all of the stock, agency costs arise since managers and outside shareholders have different interests. The manager seeks for ways that maximize his wealth resulting in agency problem
Kim, K., and Limpaphayom, P.	1998	Effective tax rate and firm size	• Dependent variable: *effective tax rates* • Independent variables: *natural logarithm of sales; leverage; ratio of market value to book value of equity; ratio of operating income to total sales.* • Control variables: *ROA*	• 1,831 firm-years observations from 5 Pacific basin countries • 1975-1992	OLS regression analysis	• There is a negative relationship between firm size and effective tax rates (large companies have lower effective tax rates than small companies). • Profitability is a significant determinant of effective tax rates.
Lanis, R. and Richardson, G.	2011	The effect of outside directors on corporate tax avoidance	• Dependent variable: *dummy variable of tax aggressiveness* • Independent variables: *proportion of outside directors;* • Control variables: *proportional change in total assets; dummy variable for company with net loss; years of listed; management stock*	• 16 Australian corporations • 2001-2006	Logit regression analysis	• There is a negative and statistically significant association between outside board of director membership and tax aggressiveness. • More independent boards appear to deter tax aggressiveness through better governance.

Author	Year	Subject	Variables	Sample & Period	Methodology	Findings
			ownership natural logarithm of sales; leverage; CEO tenure; total outstanding shares of blockholders			
McGuire, et. al.	2014	Dual class ownership and tax avoidance	• Dependent variables: *effective tax rates; cash effective tax rates* • Independent variables: *the difference between the voting rights and cash flow rights of a firm's insiders;* • Control variables: *firm size; income from foreign operations; leverage; capital intensity; R&D; ROA; loss carry forwards; equity income; growth opportunities; industry fixed effect*	• 1,857 firm-year observations • 1995-2002	OLS regression analysis	• The difference between voting rights and cash flow rights is associated with higher effective tax rates and cash effective tax rates, which suggests that managers with excessive control rights engage in significantly less tax avoidance. • Alternative explanations: a lack of incentives to maximize tax-planning opportunities; or concerns about potential price discounting by investors. • Regression output on control variables show that effective tax rates are positively (negatively) associated with firm size and ROA (leverage and capital intensity).
Minnick, K. and Noga, T.	2010	Corporate governance characteristics and tax management	• Dependent variables: *effective tax rates; cash effective tax rates* • Independent variables: *board characteristics; entrenchment; CEO compensation*	• 2,339 firm-year observations • 1996-2005	OLS regression analysis with instrumental variable	• Pay-performance sensitivity provides longer incentive horizons for directors and executives to reduce long-run taxes. • All corporate governance measure but staggered board show insignificant relationship with effective tax rates.

Author	Year	Subject	Variables	Sample & Period	Methodology	Findings
			• Control variables: *firm characteristics*			• Companies with different governance structures choose different tax management strategies.
Philips, J.	2003	The impact of after-tax performance measures to tax planning	• Dependent variables: *effective tax rates* • Independent variables: *dummy variable of CEO performance; dummy variable managers performance* • Control variables: *ratio of foreign assets; capital intensity; firm size; leverage; ROA variance; growth*	• 209 firm observations • 1997	OLS regression analysis	• After-tax manager performance measures lead to lower effective tax rate and economically significant tax benefits. • There is no support that after-tax CEO performance measures lead to lower effective tax rate.
Porcano, T.	1986	The structure of US corporate income tax rates	• *Effective tax rates*	• 1,300 firms (1982) • 850 firms (1983)	ANOVA analysis	• The average effective tax rate is low and regressive. • Larger firms have lower effective tax rates.
Rego, S.	2003	The relation between economies of scale and tax	• Dependent variables: *worldwide effective tax rates* • Independent variables:	• 19,737 firm-year observations • 1990-1997	OLS regression analysis	• Larger firms have higher effective tax rate (political cost theory); • Corporations with greater pre-tax income have a lower effective tax rate.

Author	Year	Subject	Variables	Sample & Period	Methodology	Findings
		avoidance	*natural log of total net sales; natural log of pretax accounting income; dummy variable of foreign assets or income;* • Control variables: *location, industry and year fixed dummies*			• Multinational corporations with more extensive foreign operations have lower effective tax rate (worldwide, U.S., and foreign).
Richardson, G. and Lanis, R.	2007	The determinants of tax avoidance variability	• Dependent variables: *effective tax rates* • Independent variables: *natural logarithm of total assets; leverage; capital intensity; inventory intensity; R&D intensity* • Control variables: *ROA; industry dummies; tax reform*	• 552 firm-year observations of Australian listed companies • 1997- 2003	OLS regression analysis	• There are negative correlations between effective tax rate and several firm characteristics (size, leverage, and capital intensity). • There are positive relations between effective tax rate and other variables such as investment intensity and ROA.
Salamon, L. M. and Siegfried, J. J.	1977	The impact of industry structure on public policy	• Dependent variable: *tax avoidance rate* • Independent variables: *firm size; industry size; market concentration; profit rate; geographical concentration*	• 110 observations • 1963	OLS regression	• Firm size has a positive correlation with tax avoidance rate while other variables show negative correlations with the rate. • The larger corporations generate greater political power than small firms. It confirms the political power theory.

Author	Year	Subject	Variables	Sample & Period	Methodology	Findings
Stickney, C.P. and McGee, V.E.	1982	The effect of size, capital intensity, leverage, and other factors to effective tax rate.	• Dependent variable: *effective tax rates* • Independent variables: *capital intensity; ratio of foreign sales to total sales; percentage of natural resource sales; total sales; total assets; debt to equity ratio*	• 1,097 firms • 1978-1980	Data cluster analysis	• Capital intensity, leverage, and natural resource involvement seem to play important roles distinguishing companies' effective tax rates; and • Foreign involvement and size play less important roles in determining firms' effective tax rates
Zimmerman, J.	1983	Taxes and firm size	• Dependent variable: *effective tax rates* • Independent variables: *sales*	• 43,515 firm-year observations • 1946-1981	Analysis of t-statistics	• Large firms pay proportionately more income taxes than small firms. • Tax rates are only different for roughly the largest fifty firms (i.e., a threshold effect). • Large companies have higher tax rates within industries, with the petroleum and manufacturing industries being the most pronounced and trade showing no differential tax effects

Chapter 4
Hypothesis Development

This chapter explains the formulation of research hypotheses regarding the relations between firm characteristics and variability of tax avoidance. The hypotheses are based on theories and findings of literature as described in previous chapters. The description and measurements of the variables to examine the hypotheses will be discussed in the next chapter.

4.1. Firm size and tax avoidance

Many scholars believe that firm size is one of the important factors that determine the degree of tax avoidance. The correlation between company size and tax avoidance can be explained by two opposing ideas: the political power theory and the political cost theory. The political power theory argues that larger corporations will have lower effective tax rate because they have enough economic power to influence the political process in their favor, develop expertise in tax planning and arrange optimal tax-saving mechanisms (Salamon and Siegfried, 1977). In contrast, the political cost theory suggests that the higher visibility of larger and more wealthy corporations leads them to be the objects of more extensive supervisory actions by tax authorities (Watts and Zimmerman, 1986). Since corporate income tax is one element of firms' political costs, this theory claims that larger companies will have higher effective tax rate (Zimmerman, 1983).

Previous empirical studies documented mixed findings on the association between firm size and tax avoidance measurements. Research findings of Salamon and Siegfried (1977) and Porcano (1986) support the political power theory by presenting a negative (positive) association between effective tax rates (tax avoidance rate) and firm size, respectively. Recent studies using data from different countries also support this theory (Kim and Limpaphayom, 1998; Richardson and Lanis 2007). In contrast, Zimmerman (1983), Rego (2003), and McGuire et. al (2012 and 2014) documented a positive association between effective tax rate and firm size which is consistent with his political cost theory, while Stickney and McGee (1982) concluded that these two variables are not correlated.

Gupta and Newbery (1997) suggests that the association between firm size and tax avoidance is sensitive to the sample composition and it is not likely to exist in companies with longer histories (mature). This idea is based on an argument that the previous research used

different empirical procedures, for example, sample selection, time periods, data aggregation methods, effective tax rates measurements, and firm-size proxies. Therefore, the correlation between firm size and tax avoidance seems profoundly affected by the sample selection and variables measures. Another explanation for this inconsistency is the degree of the political power, or the political cost of firms might be hugely affected by industry type. Findings of Zimmerman (1983) suggesting the relation between firm size and effective tax rates varied by industry type.

In the context of the U.S. taxation environment, I believe the political cost theory is more plausible since the taxation of U.S. corporate income is still based on progressive rate (PricewaterhouseCoopers, 2016). Usually, larger firms will generate a greater amount of profit than smaller companies because they have more capacity on production and value creation. Thus, they will bear higher income tax rates. This intuition is supported by several more current research on the U.S. firms (see Atwood et. al. 2012; McGuire et. al. 2014). After considering the industry effect, those studies conclude that firm size is positively associated with effective tax rates as predicted by the political cost theory. Therefore, as the first hypothesis of this thesis, I expect the association between effective tax rate and firm size will be positive.

H1: There is a positive association between effective tax rate and firm size

4.2. Financing structure and tax avoidance

The use of interest expense is one of the most simple of the profit-shifting techniques in the tax planning (OECD, 2017). It is reasonable because many tax authorities treat interest expense on debts as a deductible expense while return on dividend or other equity is commonly not deductible. Therefore, financing structure by mix use of debt financing and equity financing might affect the corporate effective tax rates. This logic leads a prediction that firms with higher leverage are likely to have a lower effective tax rate. Findings of Stickney and McGee (1982), Gupta and Newberry (1997), Richardson and Lanis (2007), and McGuire et. al. (2014) confirm this expectation by documented an inverse correlation between leverage and effective tax rate. Thus, my second hypothesis is the association between leverage and the tax avoidance measure will show a negative pattern.

H2: There is a negative correlation between effective tax rate and firm leverage

4.3. Investment decisions and tax avoidance

Different treatments imposed by tax authorities to capital expenditure might influence managers' investment decisions and finally also have an impact on tax planning. For instance,

tax regulation usually permits corporations to write off the depreciation expense of tangible assets within shorter periods than their expected economic lives according to the accounting standard. Consequently, companies which are more intensively invest in the capital such as property or equipment would be predicted to have a lower effective tax rate. Stickney and McGee (1982), Gupta and Newberry (1997), Richardson and Lanis (2007), and McGuire et. al. (2014) documented a negative relation between capital-intensive measure and the tax avoidance indicator. Therefore, I also hypothesize the correlation between firms capital intensity indicators and effective tax rate will show an opposite trend.

H3: There is a negative association between effective tax rate and firm capital intensity

4.4. The role of corporate governance

The agency theory views corporate governance as a mechanism to address agency problem. Tax avoidance is considered as a beneficial activity to shareholders and managers because it will increase financial performance of firms. Intuitively, tax avoidance is apparently viewed as not part of agency problems. Thus, governance mechanism might lead managers to increase the degree of tax avoidance for maximizing shareholders welfare.

However, Desai and Dharmapala (2006) proposed an argument that tax avoidance and rent extraction by managers can be complementary. Moreover, they argue that governance mechanisms such as a higher equity-based incentive will decrease not only managers' incentive to doing rent extraction but also tax avoidance. The empirical results that show a negative association between equity-based incentive and tax avoidance metrics confirm this complementary idea. This paper also analyzed moderating effect of other corporate governance factors on the association. The researchers conclude that the inverse correlation is driven primarily by poorly governance condition. On the contrary, Armstrong (2015) proposes an idea that tax avoidance is one of risky investment choices by managements since it raises many risks to the firms such as tax dispute with the tax authority and reputation damage. Unresolved agency problems might lead managers to choose the degree of tax avoidance that is contradictory with long-term shareholders' interest. Thus, governance mechanism can reduce agency problems toward tax avoidance.

The general idea of the previous discussion is tax avoidance cannot be considered solely as a beneficial activity for shareholders, but also brings a risk. Since tax planning is not only complicated but also increasing the chance of managerial opportunism and involving significant uncertainty within the company, the role of corporate governance in tax

management is critical (Minnick and Noga 2010), and governance measures such as management compensation might affect the degree of tax avoidance (Atwood et. al. 2012).

Lanis and Richardson (2011) suggest that the agency theory might not be sufficient to describe the role of corporate governance in the variability of tax avoidance. They proposed the stakeholder theory as an alternative theoretical framework. Since corporations need legitimization for their business from different stakeholders including the government, they need to comply with the tax regulation and its' underlying spirit. Thus, managers should decrease the level of tax avoidance. Also, corporate governance mechanisms will promote firms' compliance with the tax laws and their underlying spirit to maintain business legitimacy from the society.

Regarding the relation between corporate governance and characteristics of companies, some articles have provided empirical findings on it. Some papers concluded that board structure and firm size show a significant correlation (Boone et. al. 2007; Coles et. al. 2008; Link et. al. 2008). Regarding financing structure, several studies also suggest that corporate governance such as managerial entrenchment and incentives play an important role in determining the variability of financing leverage degree (Friend and Lang 1988; Berger et. al. 1997; Garvey and Hanka 1999). Moreover, other studies argue that companies' strategies on investment could be explained by governance mechanisms such as board characteristics, ownership structure and director compensation (Baysinger et. al 1991; Linn and Park 2005; Coles et al 2006; and Kor 2006).

To sum up, tax avoidance, as indicated by lower effective tax rates, increases firm performance. Thus, it is a medium to expand firm value. Naturally, shareholders prefer managers conduct more tax avoidance, and governance structure might put interest to encourage this activity. However, tax avoidance is risky for corporations and executives need to comply with the tax law along with its underlying spirit since firms have a responsibility to maintain legitimacy from the society. Therefore, corporate governance should be important to monitor the degree of tax avoidance. At the same time, corporate governance also shows power to alter tax avoidance determinants. Hence, it is possible that the difference in tax avoidance altered by the interaction effect of governance structure and other firm characteristics. Based on this argument, the last hypothesis of this thesis predicts that corporate governance structure will moderate the correlation between firm characteristics and tax avoidance.

H4: The correlation between firms characteristics and effective tax rate is moderated by corporate governance mechanisms

Chapter 5
Research Design and Methodology

5.1. Data and sample selection

This research focuses on the variability of tax avoidance among U.S. firms. I obtain the data for this study from the Wharton Research Data Services (WRDS) database for the sample period of the year 2000 to 2015. In detail, I retrieve accounting data from the Compustat. Data about corporate governance (board of directors, governance, and voting result) are collected from the Institutional Shareholder Services (ISS), while institutional ownership data are retrieved from the Thomson Reuters Stock Ownership.

Regarding the sample selection, I follow previous research that excluding companies under several criteria (Rego 2003; Richardson and Lanis 2007; Goh 2016). The final sample consists of 6,712 firms (39,877 firm-years) after eliminating firms that fall into following criteria.

a. Firms in the financial industry (SIC codes 6000 to 6999), because these firms are highly regulated, and it is likely to affect their effective tax rates differ from other firms.
b. Foreign firms, since these financing and investment decisions of these companies, may be influenced by resident country tax laws that differ from the U.S. tax laws.
c. Firms with no business activity or with missing data for one or more of the panel years as indicated by zero or negative values of book equity, stakeholder equity, and assets.
d. Firms with negative pre-tax income more than three years because effective tax rates of these firms are hard to interpret (Gupta and Newberry 1997; Richardson and Lanis 2007).
e. Firms with missing effective tax rates and firm-years with missing values also excluded because these companies might cause problems on the model.

The summary of the sample reconciliation process is presented in Table 2.

Table 2 - Sample reconciliation

	2000-2015
Number of firm-years with minimum data requirements from the Compustat	170,738
Less:	
Firms in financial industry	-44,146
Foreign firms	-36,326
Firm-years with no business activity	-15,482
Firm-years with loss more than 3 years	-19,278
Firm-years with missing ETR data	-9,362
Firm-years with missing values	- 6,267
Number of firm-years available for analysis	39,877
Number of firms	6,712

5.2. Variables and measurements

5.2.1. Dependent variable

Hanlon and Heitzman (2010) has identified several measures for tax avoidance. For this study, I use the effective tax rates as the operational proxy for the degree of tax avoidance since it is widely employed in the tax research. In general, the rate is computed by dividing estimate of tax liability by a measure of before-tax profits or cash flow. However, there is no consensus among researcher regarding measurement of the numerator and denominator.

Concerning the numerator, some researchers excluding deferred taxes from total income taxes or only use current income tax (Gupta and Newberry 1997), while other scholars (Rego 2003; Richardson and Lanis 2007) use total income taxes (GAAP income tax expense). Rego (2003) argues that excluding deferred taxes is more reflecting the time value of money, but more vulnerable to earning management. On the other hand, inclusion deferred income taxes would control earning management activities even though less capture the time value of money. Further analysis of Rego (2003) indicated that addition deferred income taxes in the calculation of effective tax rates does not alter the main result. Next, another commonly used numerator for calculation of effective tax rates is cash tax paid. Dyreng et. al (2008) argue that unlike total or current tax expense, cash tax paid takes into account the tax benefit of employee stock options. Moreover, it is not affected by estimation changes, for example the valuation allowance or tax cushion. Therefore, in this thesis, I use two measures as the numerator of effective tax rates: total income taxes and cash tax paid.

Regarding denominator, there are three measures can be used in the computing of effective tax rates: taxable income, accounting (book) income, and cash flow from operations. Most of the literature did not use taxable income as the denominator since it is already capturing tax preference. If both numerator (tax expense) and denominator (taxable income) are after tax preferences, any difference in effective tax rates because of tax preference will not be identified (Gupta and Newberry, 1997). Next, I also leave cash flow from operations in this research since it is only reflecting operational activities while corporate income tax also captures financing and investing activities. Thus, in this study, I will use accounting income (pretax income) as the denominator of effective tax rates.

In brief, this thesis will employ two measures of effective tax rates. The first measure is (*GAAP-ETR*) defined as the ratio of total income tax expense to pre-tax income less special items. The second measure (*CASH-ETR*) is defined as the ratio of cash tax paid to pre-tax income less special items.

5.2.2. Independent variables

a. Firm characteristics

Following previous research, this thesis examines three firm-level characteristics that could influence the tax avoidance level: firm size, financing structure, and capital intensity (Gupta and Newberry 1997; Richardson and Lanis 2007). Firm size (*SIZE*) is represented by the natural logarithm of total assets. Financial leverage (*LEV*) as a proxy for capital structures and financing decisions of companies is measured as the ratio of long-term debt to total assets. Lastly, for measure asset mix, I use capital intensity (*CAPINT*) indicated by the proportion of the net property, plant, and equipment divided by beginning total assets.

b. Corporate governance

Corporate governance has broadly various aspects. Daily, et. al (2003) summarized three major themes in governance studies: board oversight, shareholder activism, and governing firms in crisis. This research only focuses on the board of directors monitoring and shareholder control since both are reflecting internal and external governance mechanisms. Board monitoring will be examined using board characteristics while shareholder control will be represented by the degree of managerial entrenchment, institutional ownership, and the voting result of the shareholder's proposal. Operationalization of those concepts will be discussed below.

First, I use board characteristics since the board of directors reflects an internal mechanism to protect shareholders' interest (Jensen, 1993; Bhagat and Bolton, 2008). Technically, this study will focus on the most common board characteristics used in academic research: board size and board independence. The board size measured as the number of directors and board independence is defined as the fraction of independent directors to the board size.

Secondly, this thesis focus on managerial entrenchment to check the role of corporate governance in tax avoidance. Previous studies show that management entrenchment as indicated by anti-takeover provisions, or weaker shareholder right has a negative correlation with firm value (Bebchuk and Cohen, 2005). To measure this managerial entrenchment, I use entrenchment index (E-Index) as developed by Bebchuk et. al. (2009). This index reflects six measures of managerial entrenchment: staggered boards, limits to shareholder amendments to the bylaws, supermajority requirements for mergers, supermajority requirements for charter amendment, poison pills, and golden parachute. The index is indicated by number 0 to 6. For the purpose of this study, a company will be categorized as a well-governed firm if its E-Index is below than 4 (*GOVERN* = 1) and 0 otherwise.

Next, according to Desai and Dharmapala (2006) governance characteristics also can be identified from ownership structure, specifically institutional ownership. The use of this proxy is based on an idea that institutional shareholders have stronger incentives and higher power to monitor management performance. This variable is measured as the average of the fraction of companies' shares owned by institutional investors. Following Desai and Dharmapala (2006), an observation will be denoted as 1 if the fraction is more than 0.7, and 0 otherwise.

Lastly, this study employs voting results in the U.S. firms' annual meeting to determine the degree of external governance. Under Rule 14a-8 of the Securities Exchange Act of 1934, the shareholder in US companies is allowed to include a proposal with supporting the statement in the proxy statement distributed by a corporation for its annual shareholder meeting. Discussion and resolution of shareholder proposal in annual meeting provides insight about shareholder's interest protection in the firms. Therefore, shareholder proposals are considered as useful tools to helps mitigate of agency problems (Renneboog and Szilagyi, 2011). This thesis categorizes a firm has a good governance if annual meeting in a given year passes the shareholder proposal denoted as 1, otherwise 0.

5.2.3. Control variables

This research follows previous literature that including several control variables in the regression of tax avoidance. Firstly, tax authorities may give different tax treatment to the companies such as tax incentives based on business operations. It might cause the firms' book income will differ from the taxable income. Therefore, it is essential to control the difference in effective tax rates because of change in book income. Thus, this study includes return on assets (*ROA*) as a control variable for operating result reflected by the ratio of income before interest and taxes divided by the average of total assets.

Besides capital intensity, Gupta and Newberry (1997) and Richardson and Lanis (2007) also suggest other asset mix indicators that might influence effective tax rates. As companies need to allocate asset efficiently, intuitively inventory intensity is considered as a substitute for capital intensity. Thus, in contrast to capital-intensive companies which show lower effective tax rates, inventory-intensive firms should face higher effective tax rates. Inventory intensity (*INVINT*) is defined as the ratio of inventory to beginning total assets in our model.

Research and development activity can affect effective tax rates of a corporation. Expenditure in research and development gives a tax benefit for companies because this expense is deductible in tax calculation although the value of its benefit will be generated in the future. To control this activity, research and development intensity (*RNDINT*) will be used in

this research as indicated by the ratio of research and development expense to the average total assets.

Next, I also add a proxy for control loss carryover (*NOL*) as suggested by Desai and Dharmapala (2009), McGuire et. al (2012 & 2014), and Bradshaw (2016). Inclusion this variable in the regression estimation is to capture whether companies can utilize tax benefits associated with the loss in the previous years. In this research, *NOL* is an indicator (dummy) variable that equal to 1 if in a given year tax loss carryforward is positive, 0 otherwise.

Lastly, following Kim and Limpaphayom (1998) and McGuire et. al (2012 and 2014), I also introduce firm growth (*GROWTH*) as a control variable since startup and growing firms may have more opportunity to minimize their tax via tax incentive. Growing enterprises can make investments in assets that give tax benefit by generating time-differences in the recognition of expenses. Also, the tax authority might give tax incentives to the newcomer and growing firms. This research uses the market to book ratio, measured as the fraction of the market value of equity to book value of equity, to control companies' growth. Table 3 summarizes variables descriptions and its measurement.

Table 3 - Variable description

Variable	Description	Measurement
ETR	Effective tax rate	*GAAP-ETR* = Total income tax expense ÷ Pretax income less special items *CASH-ETR* = Cash tax paid ÷ pretax income less special items
SIZE	Firm size	The natural logarithm of total assets
LEV	Financial leverage	Long-term debt ÷ total assets
CAPINT	Capital intensity	Net property, plant, and equipment ÷ beginning total assets
GOVERN	Corporate governance	*GOVERN1* = Board size *GOVERN2* = Number of independent directors ÷ board size *GOVERN3* = 1 if E-Index < 4, 0 otherwise *GOVERN4* = 1 if fraction of institutional ownership > 0.7, 0 otherwise *GOVERN5* = 1 if shareholder proposal accepted, 0 otherwise
ROA	Return on assets	Pretax income ÷ average of total assets
INVINT	Inventory intensity	Inventories ÷ beginning total assets
RNDINT	R&D intensity	Research and development expense ÷ average total assets
NOL	Net operating loss	1 if tax loss carry-forward > 0, 0 otherwise
GROWTH	Firm growth	Market value of equity ÷ book value of equity

5.3. Research model

To examine the correlation between the variability of tax avoidance and firm characteristics as predicted in the hypotheses 1 to 3, I estimate the ordinary least square (OLS) regression model as follows:

$$ETR_{it} = \alpha + \beta_1 SIZE_{it} + \beta_2 LEV_{it} + \beta_3 CAPINT_{it} + \beta_4 ROA_i t + \beta_5 INVINT_{it} + \beta_6 RNDINT_{it} + \beta_7 NOL_{it} + \beta_8 GROWTH_{it} + Year\ Effect + Industry\ Effect + \mathcal{E} \quad (1)$$

The estimated correlation coefficients of β1, β2, and β3 indicate the degree of association between those firm characteristic with tax avoidance. Furthermore, to see the impact of corporate governance on above correlations as expected in hypothesis 4, I add to the equation (1), corporate governance variable (*GOVERN*) and its' interaction effect with those three main interest variables (*SIZE*, *LEV*, and *CAPINT*) as summarized in below equation:

$$ETRit = \alpha + \beta_1 SIZE_{it} + \beta_2 LEV_{it} + \beta_3 CAPINT_{it} + \beta_4 GOVERN_{it} + \beta_5 SIZE_{it} * GOVERN_{it} + \beta_6 LEV_{it} * GOVERN_{it} + \beta_7 CAPINT_{it} * GOVERN_{it} + \beta_8 ROA_{it} + \beta_9 INVINT_{it} + \beta_{10} RNDINT_{it} + \beta_{11} NOL_{it} + \beta_{12} GROWTH_{it} + Year\ Effect + Industry\ Effect + \mathcal{E} \quad (2)$$

To encapsulate the regression models above, I put the predictive validity frameworks (Libby's Boxes) in the Appendix part. The two boxes on the ‘Concepts’ level reflect the theoretical framework, and the two boxes on the ‘Operational’ level represent the empirical measurements. The middle boxes indicate the impact of moderating factors on the association between main independent variables and the dependent variable. The final box reflects the effect of other factors (control variables) on the dependent variable.

Empirical studies on corporate finance and governance might be affected by endogeneity issue such as omitted other variables that are not captured in the research design. To address this endogeneity problem, I use two treatments. First, I add several control variables in the research models as mentioned above. Next, I also include both year and industry fixed effects in the models. The use of industry fixed effects is to control the economic situation that could affect tax avoidance. Companies in the same industry face a similar market condition that could endogenously affect the effective tax rate.

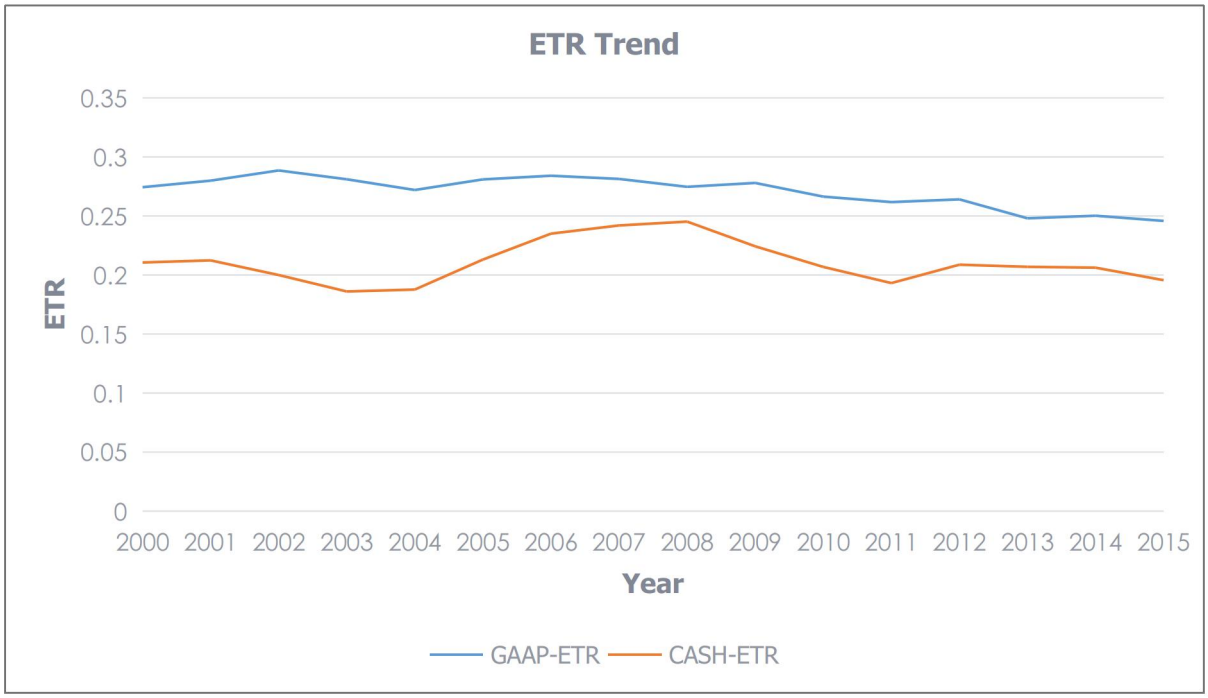
Chapter 6
Empirical Results and Analysis

6.1. Analysis of ETR trend

Figure 1 draws the general trend of the U.S. firms' effective tax rates for the period 2000 through 2015. It can be seen that on average, both rates of *GAAP-ETR* and *CASH-ETR* are below the highest statutory U.S. federal rate 35%. *GAAP-ETR* showed a downward trend gradually from 28% in 2000 to 25% in 2015. There are two downward trends on *GAAP-ETR* started in 2002 and 2009. These both decreases might be caused by the dotcom bubble in period 2000 and global financial crisis in 2008.

On the contrary, *CASH-ETR* had more fluctuating movements along the period. It seems more representing the economic cycle. After 2001, the rate showed a decrease pattern until 2004. Started in 2005, *CASH-ETR* increased up to the peak in 2008. The financial crisis in 2008 was likely impacting business world several years after this event as indicated by the gradual decrease in the effective tax rates until 2011. From 2012 until 2015, *CASH-ETR* showed a relatively steadiness rate.

Figure 1 - *GAAP-ETR* and *CASH-ETR* Trend for the Period 2000-2015



6.2. Descriptive statistics

Table 4 reports the descriptive statistics of all variables used in this thesis. The mean and median of the first dependent variable (*GAAP-ETR*) are 0.27 and 0.30, respectively. *CASH-ETR* as a second dependent variable has the average around 0.21 with median 0.17. The mean of either *GAAP-ETR* or *CASH-ETR* is relatively lower than the mean of ETR as reported in the previous research. I believe the sample composition causes it. Rather than drop all observations with negative pretax income as previous research did, I only exclude observations with more than three years loss since it is common in the business world to have a loss in book income. Another possible reason is a relatively long period of examination used in this paper. However, these numbers are consistent with previous studies that reported *CASH-ETR* is lower than *GAAP-ETR* (Dyreng et. al. 2008; McGuire 2012). The mean of firm size (natural logarithm of total assets) is 6.07 with median 6.11. Financial leverage and capital intensity have mean (median) values of 0.16 (0.12) and 0.30 (0.20), respectively.

Table 4 - Descriptive statistics

Variables	Number of Observation	Mean	Median	Standard Deviation	Percentile 25	Percentile 75
GAAP-ETR	39,877	0.272	0.307	0.196	0.126	0.373
CASH-ETR	39,877	0.211	0.179	0.214	0.023	0.318
SIZE	39,877	6.076	6.115	2.194	4.622	7.577
LEVERAGE	39,877	0.164	0.123	0.170	0.001	0.277
CAPINT	39,877	0.308	0.209	0.291	0.091	0.435
ROA	39,877	0.060	0.072	0.198	0.028	0.132
INVINT	39,877	0.139	0.086	0.164	0.009	0.207
RNDINT	39,877	0.030	0.000	0.058	0.000	0.033
NOL	39,877	0.759	1.000	0.428	1.000	1.000
GROWTH	39,877	3.537	2.056	6.186	1.273	3.489

a. Variables are defined in Table 2.
b. All continuous variables are winsorized (reset) at the 1st and 99th percentiles except for *GAAP-ETR* and *CASH-ETR*, which are winsorized at 0 and 1, respectively.

6.3. Regression assumption tests

As discussed earlier in Chapter 5, this study employs OLS regression estimation to examine the hypotheses. Regression analysis requires four assumptions for inferences: the independent variables should not be correlated, residuals follow the normal distribution, variation in the residuals is the same for both large and small predicted values, and there is a linear relationship (Lind, et.al. 2012). Consequently, to ensure the validity of the regression results, I have run several OLS assumption tests namely multicollinearity, normality, homoscedasticity, and linearity. The discussion and results of those tests are described below.

6.3.1. Multicollinearity test

The first assumption of OLS regression is independent variables in the regression model should not be correlated each other (multicollinearity). I check the correlation between variables using the Pearson correlation test. Table 5 presents the matrix of Pearson Correlation for the independent variables used in this research. The matrix shows that all independent variables have a correlation with dependent variables in the column (1) and (2) with significance level 5 percent. The value of correlation coefficients among virtually all independent variables, as indicated in the column (3) to (10), are significant within range -1 to 1. It indicates there are no multicollinearity issues between the independent variables.

Table 5 - Pearson correlation matrix

	Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*
(1)	*GAAP-ETR*	1									
(2)	*CASH-ETR*	0.323*	1								
(3)	*SIZE*	0.160*	0.104*	1							
(4)	*LEVERAGE*	0.046*	-0.040*	0.383*	1						
(5)	*CAPINT*	0.036*	-0.093*	0.215*	0.336*	1					
(6)	*ROA*	0.243*	0.182*	0.248*	-0.027*	-0.015*	1				
(7)	*INVINT*	0.032*	0.088*	-0.160*	-0.120*	-0.187*	0.079*	1			
(8)	*RNDINT*	-0.17*	-0.110*	-0.211*	-0.280*	-0.288*	-0.171*	-0.041*	1		
(9)	*NOL*	-0.110*	-0.153*	0.112*	0.094*	-0.035*	-0.157*	-0.128*	0.114*	1	
(10)	*GROWTH*	-0.122*	-0.098*	-0.150*	0.034*	0.002	-0.286*	-0.056*	0.136*	0.036*	1

Also, to check multicollinearity, I examine the Variance Inflation Factor (VIF) for all independent variables, and the results are presented in Table B1 in the Appendix. The VIF for all independent variables are below 10, and the mean of VIF is 1.40. The inverse VIF (1/VIF) is higher than 0.1. These results indicate that there is less concern about the multicollinearity in the OLS regression model.

6.3.2. Normality test

Another condition of OLS regression that should be met is the residuals should follow a normal probability distribution. To evaluate this assumption, I organize the residuals of the regression into frequency distribution and probability plot graphs. Figure B1 in Appendix B shows the graphs of residual distribution and standardized normal probability plots. It can be seen that the distribution of residuals for both regression models are not fully following normal distribution density and the probability plot graphs indicate that residuals are dispersed along the fit line. However, due to the number of my observations is very large (n > 39,000), the test is

robust to the normality assumption, and it is acceptable to run a test to the observations that not fully fit a normal distribution, or the normality assumption is violated (Rosenthal 2011).

6.3.3. Linearity test

The next condition that should be met in the regression model is the relationship between the dependent and independent variables should be linear. To illustrates the relationship between the variables used in this paper, the augmented partial residual plots are presented in the Appendix B - Figure B2. The plots indicate that the relationship between effective tax rates and firm characteristics is linear.

6.3.4. Homoscedasticity test

The last assumption of OLS regression is the variance of residual is homoscedasticity. This condition requires the variation of the predicted values is constant (Lind, et.al. 2012). The homoscedasticity assumption can be examined by using a plot of the standardized residuals with the regression standardized predicted value. This assumption is violated if there is a certain pattern scattered around the horizontal line. Figure B3 in Appendix B illustrates the plot. Some of the plots are not randomly distributed around the horizontal line. To address this issue, I use heteroscedasticity-consistent robust standard errors technique (variance cluster estimate) in my regression tests. It allows me to avoid the heteroscedastic issue in the error term from my model of estimation. Thus, I am confident that my estimation model has fulfilled the homoscedasticity condition

6.4. Regression results and analysis

This section reports for the test hypotheses that analyze: (1) the correlation between tax avoidance and firm characteristics as its determinants; and (2) the impact of corporate governance on the correlation.

6.4.1. Determinants of tax avoidance

Table 6 presents the results of OLS multivariate regression model for Equation (1) which examine the association between tax avoidance and firm characteristics. The dependent variable is effective tax rates as measured by *GAAP-ETR* in Model 1 and *CASH-ETR* in Model 2. Variables of interest are the firm size (*SIZE*), financial leverage (*LEVERAGE*), and capital intensity (*CAPINT*). The rest are control variables. For the reason of brevity, the coefficients on the industry and year fixed effects are not reported in the table.

Table 6 - Estimation of OLS regression between tax avoidance and firm characteristics

Variables [a]	Model 1 Y = *GAAP-ETR* Coefficient (t-stat)	Model 2 Y = *CASH-ETR* Coefficient (t-stat)
SIZE	0.009*** (3.93)	0.012*** (8.53)
LEVERAGE	-0.016 (-1.29)	-0.072*** (-4.73)
CAPINT	-0.020* (-2.13)	-0.063** (-3.47)
ROA	0.173*** (16.51)	0.103*** (10.23)
INVINT	0.045* (2.54)	0.048** (3.14)
RNDINT	-0.369*** (-11.12)	-0.392*** (-16.65)
NOL	-0.042*** (-5.89)	-0.073*** (-9.57)
GROWTH	-0.001*** (-5.84)	-0.001*** (-4.64)
Constant	0.272*** (16.12)	0.235*** (15.29)
Year Effects	Yes	Yes
Industry Effect [b]	Yes	Yes
R^2	0.085	0.080
Number of observations	39,877	39,877

*, **, *** Indicate significance at the 10%, 5%, and 1% levels, respectively, using a two-tailed test
a. Variables are defined in Table 3.
b. Industry dummies are based on Fama-French 38 Industry Classes (Fama and French 1997)

The linear regression estimation results in positive and significant coefficients of correlation between firm size and effective tax rates. In detail, the coefficient is 0.009 for *GAAP-ETR* and 0.012 for *CASH-ETR*. These findings are consistent with the Hypothesis 1 (H1) that predicts the association between firm size and effective tax rates is positive. Also, they accord with findings of more current research on this topic (Atwood et. al. 2012; McGuire 2012

and 2014). Interpretation of these results is the firms which have larger assets will bear and pay higher corporate income tax. Thus, based on this finding, the political cost theory seems have more explanatory power in the relation between the degree of companies' size and their tax avoidance.

Next, I find that financial leverage (*LEVERAGE*) has a negative correlation with effective tax rates. The regression model estimates the coefficient correlation between financial leverage is -0.016 with *GAAP-ETR* and -0.072 with *CASH-ETR*. However, the correlation is statistically significant only with *CASH-ETR*. This result confirms the Hypothesis 2 (H2) that expects a negative relationship between financial leverage and effective tax rates. Moreover, this result is also consistent with findings of previous literature (Gupta and Newberry 1997; Richardson and Lanis 2007; McGuire 2012 and 2014). It is congruent with the intuition that corporations with higher long-term debt proportion enjoy less corporate income tax expense since they can optimize interest expense of the debt as a medium to do tax avoidance.

The regression output also confirms the Hypothesis 3 (H3) by documenting negative coefficients of correlation between capital intensity (*CAPINT*) and effective tax rates. In detail, the coefficient is -0.020 (significant at 10% level) in the Model 1 and -0.063 (significant at 5% level) in the Model 2. These results indicate that companies with larger fixed assets have more opportunity to minimize their corporate income tax as many tax authorities may allow faster depreciation period for tax purpose.

Moreover, the regression tests also result in significant correlations between control variables and effective tax rates. Profitability which reflected by *ROA* has positive associations with effective tax rates. Inventory intensity (*INVINT*) also shows positive relations with both tax avoidance proxies. It is congruent with the argumentation that inventory intensity is a substitute for capital intensity. While capital-intensive firms enjoy smaller effective tax rates, in contrast, companies with higher inventory intensity bear and pay higher income tax expense.

The negative coefficients of correlation between research and development intensity (*RNDINT*) and effective tax rates confirm the prediction that increase in research and development activities result in a tax benefit to the companies. Next, firms which reporting tax loss carry forward have lower effective tax rates as shown by negative coefficient of *NOL*. Similarly, firm growth (*GROWTH*) also show inverse associations with effective tax rates as indicated by negative and significant coefficients between firm growth variable and effective tax rates. In short, the regression results for these control variables are consistent with findings of previous literature.

6.4.2. The impact of corporate governance

The results of OLS regression estimation for Equation (2) are presented in Table 7 and Table 8. The regression model in Equation (2) tries to test the moderating effect of governance mechanisms to the association between firm characteristics and tax avoidance. Table 7 reports the regression output with *GAAP-ETR* as a measure for tax avoidance, and Table 8 presents the estimation output with *CASH-ETR* as the dependent variable. Recall the explanation in Chapter 5, this thesis examines the moderating effect of corporate governance by employing an OLS regression with the interaction term of governance variable. To increase validity and robustness of the regression estimation, I use several proxies to measure governance. Therefore, the discussion of these regression results will be delivered separately for each measure.

a. Board characteristics

Column (2) and (3) on Table 7 and Table 8 report empirical estimation for Equation (2) using board structures (board size and board composition) as indicators of corporate governance. The coefficients of association between board characteristics variables *(GOVERN)* and effective tax rates are positive but insignificant, except between board composition and *GAAP-ETR* which is negative. These findings suggest that internal governance mechanisms control tax avoidance, but the control has not significant direct impact on tax management. It is in line with the argumentation that tax avoidance is an agreeable activity for firm performance and shareholders' wealth. Moreover, these insignificant results are consistent with the previous study (Minnick and Noga 2010).

Furthermore, the moderating role of a board of directors in the association between firm characteristics and tax avoidance as predicted in Hypothesis 4 (H4) can be checked by analyzing the coefficient of the interaction term between firm characteristics and corporate governance (β_5 - β_7). The outputs of OLS estimation show that almost all interaction terms are statistically not significant. The interaction term is only significant at 10% between leverage and governance with *GAAP-ETR*. Thus, these findings imply that Hypothesis 4 should be rejected. In other words, corporate governance, especially internal mechanisms, do not affect the association between tax avoidance and its determinants.

b. Management entrenchment

The next indicator that used to measure corporate governance is management entrenchment as indicated by E-Index. I assign a company to be a well-governed company

Table 7 - Estimation of OLS regression between tax avoidance and firm characteristics with interaction effect of corporate governance

Y = *GAAP-ETR*	Model 1 Coefficient (t-stat)	Model 2 Coefficient (t-stat)	Model 3 Coefficient (t-stat)	Model 4 Coefficient (t-stat)	Model 5 Coefficient (t-stat)
(1)	(2)	(3)	(4)	(5)	(6)
SIZE	-0.001 (-0.25)	-0.007 (-0.68)	-0.007* (-2.44)	0.006** (2.97)	-0.003 (-0.92)
LEVERAGE	0.084* (2.38)	0.044 (0.41)	-0.005 (-0.33)	-0.011 (-0.66)	0.000 (0.02)
CAPINT	-0.053 (-1.75)	-0.056 (-1.04)	-0.01 (-1.06)	-0.035* (-2.42)	-0.001 (-0.13)
GOVERN [a]	0.006 (1.13)	-0.038 (-0.45)	-0.019 (-1.46)	0.063** (3.57)	-0.001 (-0.02)
SIZE x GOVERN	-0.001 (-1.03)	0.001 (0.05)	0.002 (1.04)	-0.009*** (-4.2)	-0.003 (-0.53)
LEVERAGE x GOVERN	-0.010* (-2.20)	-0.047 (-0.36)	-0.032 (-1.14)	0.007 (0.3)	0.001 (0.03)
CAPINT x GOVERN	0.005 (1.52)	0.056 (0.92)	0.011 (0.89)	0.041 (1.72)	0.051 (1.9)
ROA	0.278*** (9.66)	0.278*** (9.62)	0.290*** (9.16)	0.197*** (14.47)	0.237*** (11.12)
INVINT	0.018 (0.67)	0.019 (0.69)	0.021 (0.74)	0.044* (2.36)	0.033 (1.46)
RNDINT	-0.339*** (-10.37)	-0.346*** (-11.41)	-0.328*** (-7.73)	-0.402*** (-12.82)	-0.391*** (-15.21)
NOL	-0.016*** (-5.66)	-0.016*** (-5.38)	-0.016*** (-4.58)	-0.037*** (-6.32)	-0.031*** (-9.39)
GROWTH	-0.001* (-2.54)	-0.001* (-2.55)	-0.001 (-1.63)	-0.001*** (-6.46)	-0.001** (-3.13)
Constant	0.337*** (7.2)	0.408*** (5.32)	0.378*** (14.75)	0.290*** (16.54)	0.326*** (13.51)
Year Effects	Yes	Yes	Yes	Yes	Yes
Industry Effect [b]	Yes	Yes	Yes	Yes	Yes
R^2	0.063	0.062	0.064	0.076	0.061
Number of observations	14,708	14,708	12,457	33,899	21,112

* , ** and *** indicate significance at the 10%, 5%, and 1%, respectively.

a. *GOVERN* = governance variable; in Model 1 = board size; in Model 2 = % of independent directors in the board; in Model 3 = 1 if E-Index <4, 0 otherwise; in Model 4 = 1 if institutional ownership > 70%, 0 otherwise; in Model 5 = 1 if shareholder-sponsored meeting agenda is pass, 0 otherwise.

b. Industry dummies are based on Fama-French 38 Industry Classes (Fama and French 1997)

Table 8 - Estimation of OLS regression between tax avoidance and firm characteristics with interaction effect of corporate governance

Y = *CASH-ETR*	Model 1 Coefficient (t-stat)	Model 2 Coefficient (t-stat)	Model 3 Coefficient (t-stat)	Model 4 Coefficient (t-stat)	Model 5 Coefficient (t-stat)
(1)	(2)	(3)	(4)	(5)	(6)
SIZE	-0.004	0.007	-0.002	0.010***	0.004*
	(-0.67)	(0.52)	(-0.62)	(7.30)	(2.43)
LEVERAGE	-0.093	-0.2	-0.096***	-0.082***	-0.066**
	(-1.63)	(-1.85)	(-4.88)	(-5.67)	(-3.50)
CAPINT	-0.087	-0.082	-0.086***	-0.066**	-0.069**
	(-1.62)	(-1.28)	(-3.91)	(-3.41)	(-2.96)
GOVERN [a]	0.007	0.062	0.03	0.03	-0.006
	(1.03)	(0.50)	(1.42)	(1.49)	(-0.14)
SIZE x GOVERN	-0.000	-0.012	-0.003	-0.004	0.002
	(-0.44)	(-0.71)	(-0.87)	(-1.34)	(0.36)
*LEVERAGE * GOVERN*	0.001	0.141	-0.018	0.022	-0.057
	(0.18)	(1.05)	(-0.51)	(1.61)	(-1.10)
*CAPINT * GOVERN*	-0.000	-0.003	0.025	-0.015	-0.013
	(0.02)	(-0.03)	(1.45)	(-1.71)	(-0.44)
ROA	0.084**	0.087**	0.077*	0.122***	0.093***
	(3.38)	(3.30)	(2.62)	(8.81)	(4.80)
INVINT	0.017	0.018	-0.007	0.053**	0.032
	(0.75)	(0.73)	(-0.32)	(3.28)	(1.98)
RNDINT	-0.544***	-0.560***	-0.571***	-0.437***	-0.533***
	(-11.37)	(-11.12)	(-10.09)	(-15.34)	(-12.50)
NOL	-0.037***	-0.037***	-0.040***	-0.070***	-0.058***
	(-6.36)	(-6.30)	(-7.22)	(-8.90)	(-12.52)
GROWTH	-0.001	-0.001	0	-0.001***	-0.001
	(-1.59)	(-1.42)	(-0.43)	(-5.63)	(-1.78)
Constant	0.330***	0.297**	0.355***	0.249***	0.247***
	(7.59)	(3.15)	(10.43)	(17.65)	(13.32)
Year Effects	Yes	Yes	Yes	Yes	Yes
Industry Effect [b]	Yes	Yes	Yes	Yes	Yes
R^2	0.052	0.049	0.053	0.074	0.058
Number of observations	14,708	14,708	12,457	33,899	21,112

* , ** and *** indicate significance at the 10%, 5%, and 1%, respectively.

a. *GOVERN* = governance variable; in Model 1 = board size; in Model 2 = % of independent directors in the board; in Model 3 = 1 if E-Index <4, 0 otherwise; in Model 4 = 1 if institutional ownership > 70%, 0 otherwise; in Model 5 = 1 if shareholder-sponsored meeting agenda is pass, 0 otherwise.

b. Industry dummies are based on Fama-French 38 Industry Classes (Fama and French 1997)

(*GOVERN* = 1) if it has E-Index below four since the range of E-Index is 0 to 6. The results of association estimation between management entrenchment with tax avoidance and its interaction effect are provided in Column (4) of Table 7 and Table 8.

The regression results of *GOVERN* variable indicate that the correlation between management entrenchment and tax avoidance is affected by tax avoidance measurement. The coefficient is negative with *GAAP-ETR* ($\beta_4 = -0.019$), and positive with *CASH-ETR* ($\beta_4 = 0.03$). However, the t-stat value of both coefficients suggests that the relationship is not significant (t-stat are -1.46 and 1.42). This finding implies that there is no significant difference between well-governed companies (lower management entrenchment) and poor-governed companies (higher management entrenchment) in the context of tax avoidance activities. Next, the coefficients of the interaction term between management entrenchment and firm characteristics also suggest that corporate governance is playing less important in the association between determinants of tax avoidance and the degree of tax avoidance. All coefficients of interaction term are statistically insignificant. Hence, similar to the previous proxy of governance (board characteristics), using management entrenchment also result in rejection of Hypothesis 4.

c. Institutional ownership

This thesis also employs another indicator of external governance mechanism: ownership structure. Firms that highly owned by institutional investors are supposed to have better governance since the investors have more incentive and power to control executives. As discussed previously, in this research a firm will be categorized has better governance if more than 70% of its shares held by institutional shareholders.

Column (5) of Table 7 and 8 present the estimation results of Equation (2) regarding this variable. The coefficients of *GOVERN* variable are positive in both models, but only significant with *GAAP-ETR* as the dependent variable. It denotes that firms owned by a larger proportion of institutional shareholders are less aggressive in tax avoidance activities. Thus, it is implying that higher institutional ownership as an external governance factor offers a better control of tax management by executives compare to internal mechanism.

Interaction term between institutional ownership and firm characteristics only significant exclusively with firm size ($\beta_4 = -0.009$, t-stat = -4.2). These results suggest that in a group of companies with less institutional shareholders, big firms have higher effective tax rates as indicated by $\beta_1 = 0.006$. On the other hand, in the group of larger institutional-owned companies, big corporations enjoy lower effective tax rates ($\beta_1 + \beta_4 = -0.003$). We can conclude that the association between firm size and tax avoidance (*GAAP-ETR*) is affected by ownership

structure. In contrast, other firm characteristics (leverage and capital intensity) show insignificant interaction with institutional ownership. Combining these results suggests that institutional ownership has an impact only on the relation between firm size and *GAAP-ETR*. Therefore, using institutional ownership as a governance indicator also fails to support Hypothesis 4 entirely.

d. Voting results

Finally, I include voting result as the proxy of shareholder activism to measure external corporate governance mechanism. If in a given year, voting result in annual meeting passes the shareholder-sponsored agenda, a company will be categorized as a well-governed firm (*GOVERN* = 1). The last column in Table 7 and 8 present the regression results of this governance indicator.

The OLS tests estimate a negative but insignificant relationship between corporate governance and both tax avoidance measures (β_4 is -0.001 and -0.006). It suggests that firms which have higher shareholder activism show no difference tax avoidance level from other companies. Next, similar to other measures before, all interaction terms between shareholder activism and firm characteristics as indicated by β_5 to β_7 denote an insignificant impact of corporate governance on the relation between tax avoidance and the determinants. These results are implying that Hypothesis 4 as formulated in Equation (2) have no adequate statistical supports. Thus, based on this finding, again I reject Hypothesis 4.

6.5. Summary of hypotheses tests

Based on OLS regression estimation, this thesis investigates the determinants of tax avoidance variability among the U.S. companies. In detail, this thesis focuses on three firm-level characteristics: firm size, financial leverage, and capital intensity. The relationship for this subtopic is predicted in Hypothesis 1 to Hypothesis 3. Furthermore, this thesis also examines the possibility that corporate governance moderates the association between tax avoidance and companies' characteristics as expected in Hypothesis 4.

a. Hypothesis 1

The first hypothesis of this thesis expects the relation between firm size and effective tax rates will be positive. The regression outputs show that firm size has a positive and significant correlation with effective tax rates. Thus, this empirical result supports Hypothesis 1. It implies that higher companies reported and paid higher corporate income tax than small companies.

This situation can be explained by the political cost theory which argues that bigger companies have higher income tax burden since their larger size makes them be objects of wider monitoring by tax authorities.

b. Hypothesis 2

Hypothesis 2 predicts that the financing leverage and effective tax rates will show a negative pattern. The OLS regression confirms this prediction by estimating a negative coefficient of leverage level with effective tax rates primarily cash effective tax rates. This finding suggests that a corporation with a higher portion of long-term debt on their assets avoids more income tax as indicated by lower income tax expense. Therefore, based on this result, Hypothesis 2 is accepted.

c. Hypothesis 3

This thesis also expects that capital intensity has an inverse correlation with effective tax rates as formulated in Hypothesis 3. Statistical result on capital intensity confirms this hypothesis by documenting a negative and significant coefficient between two variables. It is implying that companies whose asset contain a higher proportion of fixed asset report less corporate income tax compared to firms with a lower fraction of fixed assets.

d. Hypothesis 4

This study hypothesizes governance mechanism will affect the relationship between firm characteristics and tax avoidance. Hypothesis 4 stated that the correlation between firm characteristics and effective tax rates is moderated by corporate governance. The regression outcomes show insignificant interaction terms almost for all governance measures, so Hypothesis 4 should be rejected. Consistent with previous research, this finding suggests that corporate governance plays a less important role on the relationship between firm characteristics and tax avoidance (Minnick and Noga 2010). A possible explanation for this phenomenon is elaborated by Armstrong et. al. (2015). They argue that the link between corporate governance does not occur at the center value of tax avoidance distribution but the right and left tails of tax avoidance distribution.

In brief, this thesis accepts all hypotheses related to the correlation between firm characteristics and tax avoidance (H1-H3). However, it fails to find a significant impact of corporate governance as moderating factor on that correlation, so it rejects hypothesis 4.

6.6. Comparison with prior research

Empirical results of this study are primarily congruent with prior research on the topic of corporate income tax avoidance and corporate governance. This thesis reports a positive association between firm size and tax avoidance. Since previous literature documented mixed results on this subject, the finding of this thesis is in line with the political cost theory (Zimmerman 1983) and empirical results of recent studies (Rego 2003; Atwood et. al. 2012; and McGuire et. al. 2014). On the contrary, the statistical results on financing leverage and degree of tangible asset indicate both variables negatively correlated with effective tax rates. It is conforming finding of many previous studies (Stickney and McGee 1982; Gupta and Newberry 1997; Richardson and Lanis 2007; McGuire et. al. 2014).

For the moderating effect of corporate governance, the regression estimation using interaction term fails to find a significant impact of governance mechanism on the relationship between tax corporate tax avoidance and its determinant. It is consistent with several prior research which also could not find a significant correlation between tax avoidance (effective tax rates) and corporate governance ((Minnick and Noga 2010; Armstrong et. al., 2015). Other studies find a link between tax avoidance and governance mechanism, but these studies employ different research design. For example, Desai and Dharmapala (2006) uses residual regression of book tax gap to measure tax avoidance, while Lanis and Richardson (2011) usages dummy variable of tax aggressiveness. Table 9 below summarizes the comparison between findings of this study with previous related literature.

Table 9 - Comparison of thesis results with prior literature

Author	Subject	Paper Findings	Thesis Findings
Armstrong, et. al. (2015)	Corporate governance, incentives, and tax avoidance	Risk-taking equity incentives are positively related to tax avoidance, and the relationship is stronger in the right tail of the tax avoidance distribution. Board financial sophistication and independence also exhibit a positive (negative) relation with tax avoidance in the left (right) tail of the tax avoidance distribution.	The findings of this thesis are ***consistent*** with this paper. When using the central value of distribution (mean) in the OLS regression, the authors fail to find a correlation between tax avoidance and corporate governance. It is in line with results of this thesis that fails to find interaction effect of governance on tax avoidance relationship. However, the researchers find a significant relationship between tax avoidance and governance by using right (left) distribution value.
Atwood, T.J. et al. (2012)	Home country tax system	Firms avoid more taxes when the home country has	The results of this thesis are ***partially congruent*** with this paper. Control

Author	Subject	Paper Findings	Thesis Findings
	characteristics and corporate tax avoidance	lower required book-tax conformity, a worldwide approach, and a lower perceived strength of tax enforcement. The association between tax avoidance and tax system characteristics is affected by the proportion of variable pay portion on management compensation.	variables on this article show a similar sign with main hypotheses of this thesis (H1 and H2). However, the paper documented a significant moderating effect of corporate governance (executive compensation) on tax avoidance relationship with tax system characteristics while this thesis finds an insignificant moderating effect of corporate governance.
Badertscher, et. al. (2010)	Impact of private equity ownership on corporate tax planning	Private equity (PE)-backed and majority PE-backed firms engage in significantly more non- conforming tax planning and have lower marginal tax rates than other private firms. PE firms have the resources and expertise to promote greater tax avoidance at portfolio firms, and this effect is magnified for portfolio firms that are either majority-owned or owned by larger PE firms.	The findings of this article indicate that ownership structure affects the degree of tax planning/avoidance. It is ***partly consistent*** with the result of this thesis which shows that institutional ownership has a positive relationship with effective tax rates (*GAAP-ETR*). However, since measures of ownership structure used in the studies are different, the results of this article and this paper cannot be compared directly.
Badertscher, et. al. (2013)	The separation of ownership and corporate tax avoidance	Management-owned firms avoid significantly less income tax than PE-backed firms, consistent with the separation of ownership and control having a significant impact on the tax avoidance practices of private firms. PE-backed firms can reduce portfolio firms' marginal costs of tax avoidance, resulting in greater tax avoidance than management -owned firms.	This paper concludes that companies with higher management ownership do less tax avoidance. This result is ***congruent*** with this thesis since both studies documented a relationship between ownership structure and tax avoidance. The coefficient of correlation between institutional ownership and effective tax rates in this thesis show that corporations which owned by institutional investor also less avoid income tax expense.
Chan, et. al. (2013s)	Government ownership, corporate governance, and tax aggressiveness	Government-owned firms pursue less aggressive tax strategies because managers of these companies have the political objectives of protecting state revenues. Non-government controlled firms with higher board	The thesis suggests that governance structure (institutional shareholding) has a correlation with tax avoidance activities as indicated by a positive correlation with *GAAP-ETR*. But it does not show moderating impact on tax avoidance and its determinant association. This is ***not consistent***

Author	Subject	Paper Findings	Thesis Findings
		equity holdings and duality duties performed by the board chairman are more tax aggressive. Management of non-government-controlled firms, particularly those with dominant CEOs, tend to exploit aggressive tax planning.	with this paper that argues the board ownership and duality duties have significant relation with tax aggressiveness.
Desai, M., & Dharmapala, D. (2006)	High-powered incentives and tax avoidance	Incentive compensation appears to be a significant determinant of tax avoidance activity. Higher- powered incentives are associated with lower levels of tax sheltering. Also, the relation is mediated by firms' governance and it does not hold for well- governed firms.	The outcome of the thesis is ***not in line*** with this article. Desai and Dharmapala (2006) finds that corporate governance moderates the relationship between executive compensation and tax avoidance level. On the contrary, the findings of this paper reject the hypothesis that predicts corporate governance influence the relationship between tax avoidance degree and firm-level characteristics.
Gupta, S., and Newberry, K. (1997)	Determinants of the variability of corporate effective tax rates	Effective tax rates are positively (negatively) associated with firm size for the period before (after) Tax Reform Act of 1986, respectively. Also, the rates are negatively associated with firm capital structure (leverage), asset mix and financial performance.	The findings of this thesis are mainly ***consistent*** with the article as indicated by a negative correlation between effective tax rates with financing leverage, capital intensity, and profitability. However, the paper documented inconsistent correlations between firm size and effective tax rates concerning the Tax Reform Act 1986.
Jensen, M., and Meckling, W. (1976)	Theory of the firm: managerial behavior, agency costs, and ownership	Separation of ownership and control has agency costs. In case a manager owns 100% of the stock, he will act in the way that maximizes firm's wealth. In the case when he doesn't own all of the stock, agency costs arise since managers and outside shareholders have different interests. The manager seeks for ways that maximize his wealth resulting in agency problem	Results of this article are ***not applicable*** to findings of this thesis. This article discusses a theoretical framework that explains the relationship between principal and agent (agency theory). This theory is used to describe and predict the possible association among variables in this thesis.

Author	Subject	Paper Findings	Thesis Findings
Kim, K., and Limpaphayom, P. (1998)	Effective tax rate and firm size	There is a negative relationship between firm size and effective tax rates (large companies have lower effective tax rates than small companies). Next, the paper concludes that profit is a significant determinant of effective tax rates.	The outcome of this thesis is ***contradictory*** with the result of this paper. Study on this thesis concludes that firm size has a positive association with effective tax rates. This contradiction might be caused by the difference in the sample and effective tax rates measures. Kim and Limpaphayom (1998) analyzed data from five Basin Pacific countries.
Lanis, R., and Richardson, G. (2011)	The effect of outside directors on corporate tax avoidance	There is a negative and statistically significant link between outside board of director membership and tax aggressiveness. More independent boards appear to deter tax aggressiveness through better governance.	Research of this thesis results in no significant impact on corporate governance including board characteristics to the relationship between tax avoidance and firm characteristics. It is ***inconsistent*** with the result of this paper that shows outside directors affect the level of tax aggressiveness. However, this paper examines a relatively small number of observations from Australia.
McGuire, et. al. (2014)	Dual class ownership and tax avoidance	The difference between voting rights and cash flow rights is associated with higher effective tax rates which suggests that managers with excessive control rights engage in significantly less tax avoidance. Alternative explanations: a lack of incentives to maximize tax-planning opportunities; or concerns about potential price discounting by investors. Regression output on control variables show that effective tax rates are positively (negatively) associated with firm size and ROA (leverage and capital intensity).	This thesis generates ***consistent*** result with this paper. On the one hand, both firm size and ROA show a positive relationship with effective tax rates suggesting that larger and more profitable companies pay more income tax. On the other hand, regression estimation on this thesis also shows that effective rates have a negative association with financing leverage and capital intensity as reported in McGuire et. al. (2014).
Minnick, K., and Noga, T. (2010)	Corporate governance characteristics and tax	Pay-performance sensitivity provides longer incentive horizons for directors and executives to reduce	The findings of this thesis ***confirm*** results of Minnick and Noga (2010) by documenting an insignificant correlation between corporate

Author	Subject	Paper Findings	Thesis Findings
	management	long-run taxes. All corporate governance measure but staggered board show insignificant relationship with effective tax rates.	governance and effective tax rates.
Philips, J. (2003)	The impact of after-tax performance measures to tax planning	Performance measures of business unit manager that use after-tax indicator lead to lower effective tax rate and significant tax benefits. There is no support that after-tax CEO performance measures lead to lower effective tax rate.	The result of this paper indicates that on the firm-level, executive compensation design does not show significant association with level of firm tax planning. This conclusion is ***in line*** with this thesis that also finds that internal corporate governance mechanism shows insignificant relation and moderating effect with tax avoidance.
Porcano, T. (1986)	The structure of US corporate income tax rates	The average effective tax rate is low and regressive. Larger firms have lower effective tax rates.	The findings in this thesis are ***partly congruent*** with this article. Analysis on the trend of effective tax rates in the U.S. indicates that average of effective tax rates is lower than the U.S. statutory rate. While Porcano (1986) concludes that larger companies have less effective tax rates, the outcome of this thesis shows reversing pattern. This thesis concludes that larger companies have higher effective tax rates.
Rego, S. (2003)	The relation between economies of scale and tax avoidance	Larger firms have higher effective tax rate (political cost theory). Corporations with greater pre-tax income have a lower effective tax rate. Multinational corporations with more extensive foreign operations have lower effective tax rate (worldwide, U.S., and foreign).	This thesis documents ***consistent*** results with this paper. Both pieces of researches conclude that firm size has a positive correlation with effective tax rates. It implies that larger corporation reports higher corporate tax income than smaller firms.
Richardson, G. and Lanis, R. (2007)	The determinants of tax avoidance variability	There are negative links between effective tax rate and several firm characteristics (firm size, financing leverage, and capital intensity).	Almost all regression estimations on this thesis are ***in line*** with this paper. The sign of regression coefficient on financing leverage, capital intensity, investment intensity, R&D intensity, and ROA are similar with findings of this article. The only inconsistent

Author	Subject	Paper Findings	Thesis Findings
		There are positive relations between effective tax rate and other variables such as investment intensity and ROA.	result is found within correlation between firm size and effective tax rates. Difference data source could be able to explain this difference.
Salamon, L. M. and Siegfried, J. J. (1977)	The impact of industry structure on public policy	Firm size has a positive correlation with tax avoidance rate while other variables show negative correlations with the rate. The larger corporations generate greater political power than small firms. It confirms the political power theory.	This paper show ***contradictory*** findings with this thesis. Results in Salamon and Siegfried (1977) suggest that larger firms avoid corporate income tax more than smaller companies as predicted by the political power theory. Inversely, this thesis concludes that bigger corporations report and pay larger income taxes than smaller firms as expected by the political cost theory.
Stickney, C., and McGee, V. (1982)	The effect of size, capital intensity, leverage, and other factors to effective tax rate.	Capital intensity, leverage, and natural resource involvement seem to play important roles in distinguishing companies' effective tax rates. Foreign involvement and size play less important roles in determining firms' effective tax rates	This thesis documents ***partially consistent*** results with this paper. Stickney and McGee (1982) concludes that capital intensity and financing leverage inversely correlated with effective tax rates. It is congruent with the hypothesis and results of this thesis. At the same time, this article concludes that firm size is insignificant determinants of tax avoidance while this thesis finds a contrary result by documenting a significant correlation between firm size and effective tax rates.
Zimmerman, J. (1983)	Taxes and firm size	Large firms proportionately pay more taxes than small firms. Tax rates are only different for roughly the largest fifty firms (i.e., a threshold effect). Large companies have higher tax rates within industries, with the petroleum and manufacturing industries being the most pronounced and trade showing no differential tax effects.	The conclusion of this thesis is ***congruent*** with this article. Both studies suggest that larger corporations pay higher corporate income tax compared to smaller firms. Also, both studies take into account the important aspect of industry type on the analysis.

Chapter 7
Conclusion, Limitation and Suggestion

7.1. Conclusion

The aim of this research is to investigate the determinants of tax avoidance variability among firms and to examine the possibility of corporate governance as a moderating variable on the tax avoidance-firm characteristics relationship. By analyzing panel data of more than 6,700 U.S. companies from the year 2000 to 2015, this thesis documents empirical findings that indicate a significant association between several firm characteristics and effective tax rates. Consistent with the hypotheses, this study concludes that firm size has a positive correlation with effective tax rates implying that larger firms burden higher corporate income taxes. In addition, financial leverage and capital intensity show negative correlations with effective tax rates suggesting that companies with a greater proportion of debt and tangible asset have more chance to minimize their tax obligations. However, this thesis fails to find statistical finding regarding moderating effect of corporate governance on those correlations.

The results of this thesis provide additional insight into current academic and business environment. First, this study amplifies prior research in tax avoidance study. Instead of using cross-sectional or time series data-sets, this study utilizes panel data with relatively long time span (15 years). Furthermore, to my knowledge, this study is the initial empirical study that examines the moderating impact of corporate governance on the correlation between tax avoidance and firm characteristics as the determinants. This thesis also should be relevant to investors. Since corporate governance is mechanisms to protect shareholders' interest and wealth, investigating the role of corporate governance to the determination of tax avoidance degree can give insight to shareholders about to what extent impact of their monitoring on tax management.

7.2. Limitation

I acknowledged several limitations contained in this research. First, the validity of effective tax rates as the proxy of tax avoidance is questionable since it is an indirect measures of tax avoidance degree. Ideally, measurement of corporate income tax avoidance uses information in the companies' tax returns. However, because tax returns are confidential documents, it is difficult to quantify tax avoidance accurately. Second, research model in this

thesis might omit other important variables that could affect empirical results. Structural changes within companies that hugely affect business operations such as merger and acquisition were not captured in the estimation model. Even though I use year and industries-fixed-effect techniques, this approach maybe not enough to address this endogeneity issue.

7.3. Suggestion

Results of this thesis suggest several matters could be elaborated in the future research. First, as suggested by Armstrong et. al (2015), analyzing extreme values of tax avoidance distribution might be more powerful to explain the role of corporate governance. Thus, investigation on interaction term between corporate governance and firm characteristics might be more valid if using other regression techniques. Next, this research focuses on general corporate income tax. Further examination of the impact of governance mechanisms on specific categories of corporate income tax such as state, federal or international taxes could provide more plausible results. Also, future research could expand sample of the study beyond U.S. business environments since both tax avoidance and corporate governance related to regulatory settings or legal frameworks.

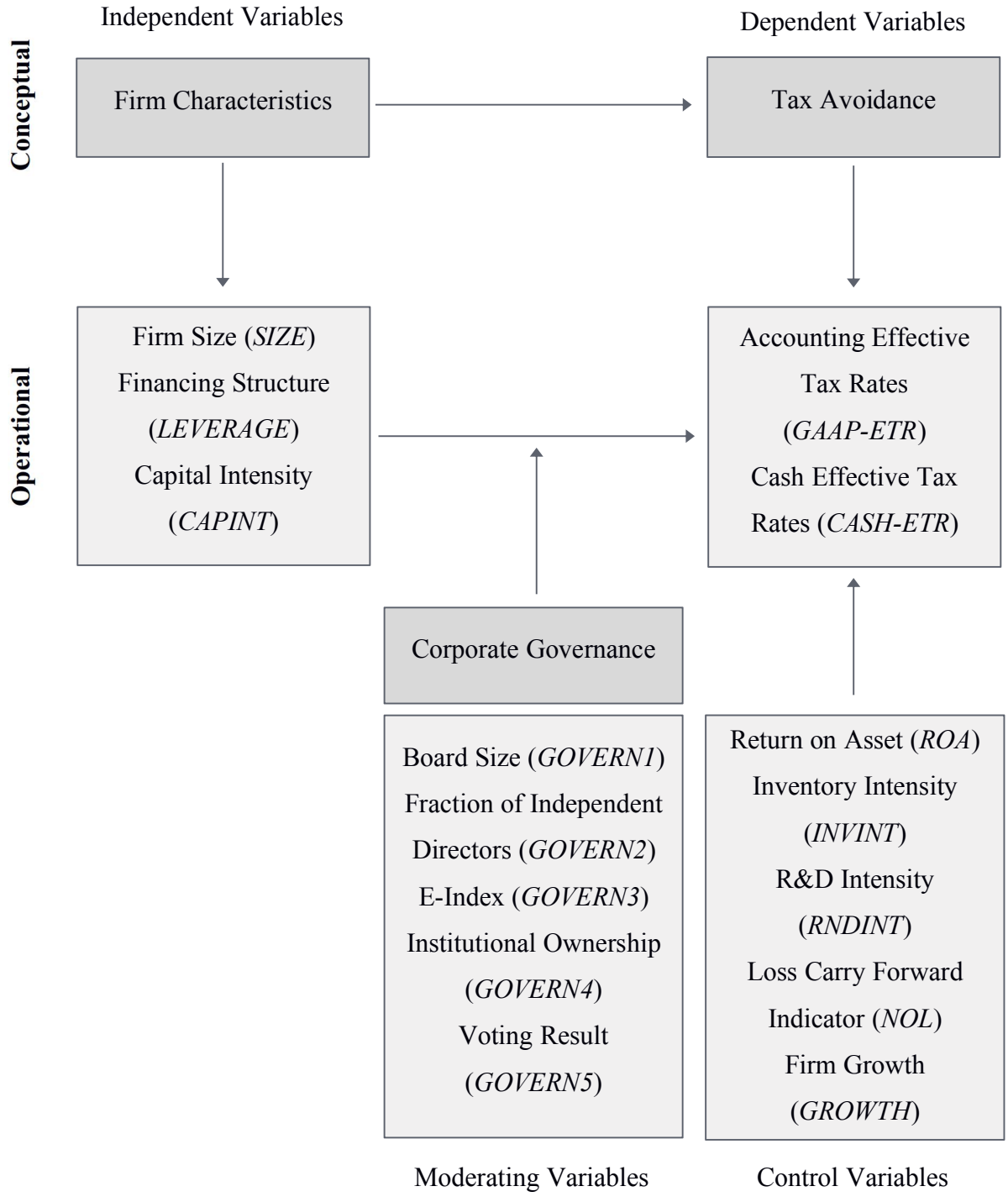
Trend analysis of the effective tax rates in this thesis also provides an important awareness about the level and propensity of corporate tax avoidance, especially in the U.S. companies. The small and decreasing effective tax rates both on accounting book income or cash paid to income tax indicates that the challenge for tax authorities to handle tax avoidance becomes higher than before. Hence, the governments should design better rules, policies and supervision techniques to address this problem.

Next, this study also gives an intriguing insight into the influence of current corporate governance mechanisms to the tax planning activities. As indicated by previous research and this thesis, the role of internal governance structures especially the board of directors seems weak to moderate the degree of tax avoidance. On the other hand, external governance mechanisms such as ownership structure might offer stronger power to monitor management's decisions in the tax matters. Therefore, in the context of tax-aggressiveness control, shareholders should put higher concern on the effectiveness of external governance supervision. Additionally, even though it is very natural for management to pursue tax avoidance activity, the academic discussion in the tax avoidance suggests that management should be aware of the long term risk of this activity to the firm's value and reputation.

Appendix

A. Predictive validity framework (Libby Boxes)

Figure A1 - Predictive validity framework



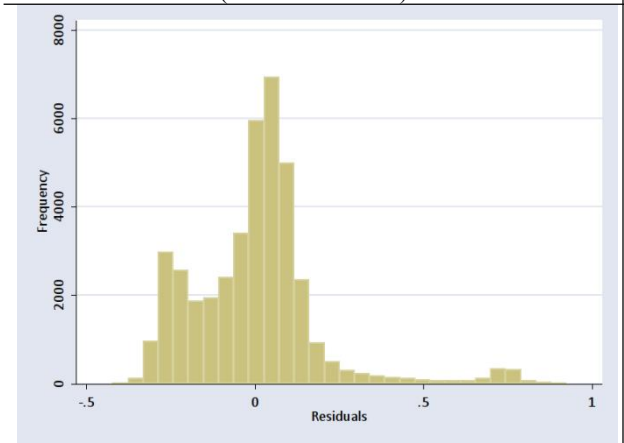
B. OLS regression assumption test results

Table B1 - Variance Inflation Factor

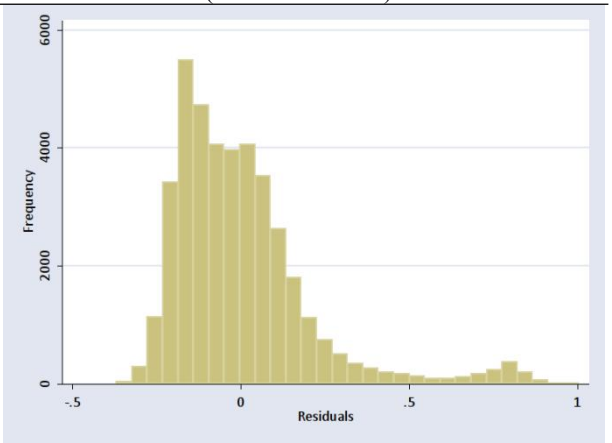
Variable	VIF	1/VIF
SIZE	1.45	0.690
LEVERAGE	1.44	0.695
CAPINT	1.84	0.545
ROA	1.21	0.824
INVINT	1.44	0.694
RNDINT	1.60	0.624
NOL	1.14	0.880
GROWTH	1.11	0.901
Mean VIF	1.40	

Figure B1 - Residual Distribution Graph and P-P Test of Residual

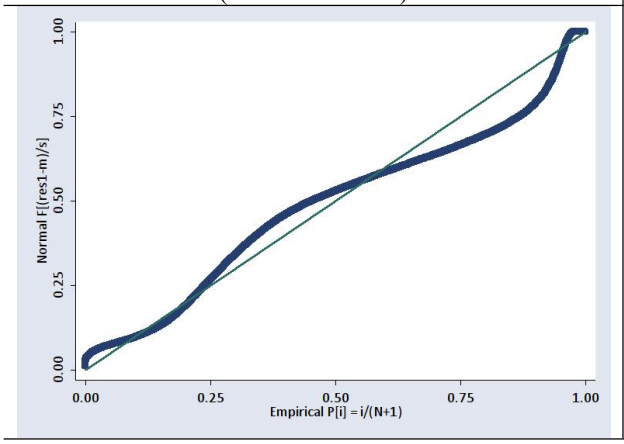
Panel A - Residual Distribution
(Y = *GAAP-ETR*)



Panel B - Residual Distribution
(Y = *CASH-ETR*)



Panel D - P-P Plot Test of Residual
(Y = *GAAP-ETR*)



Panel D - P-P Plot Test of Residual
(Y = *CASH-ETR*)

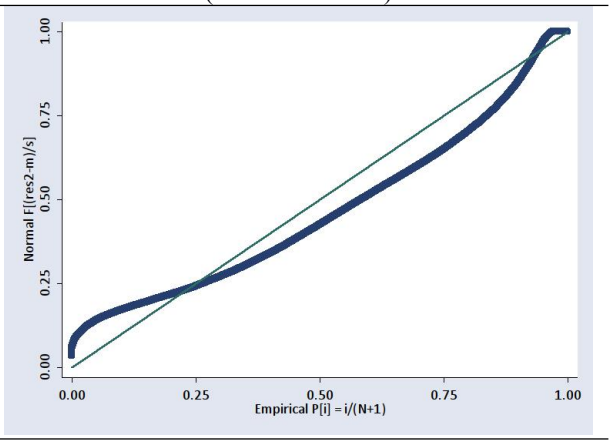
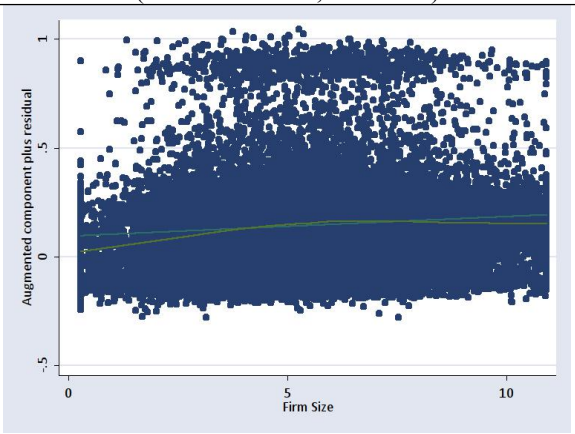
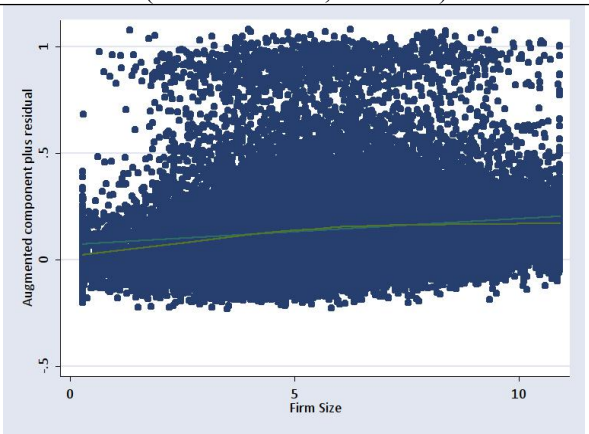


Figure B2 - Augmented Partial Residual Plot

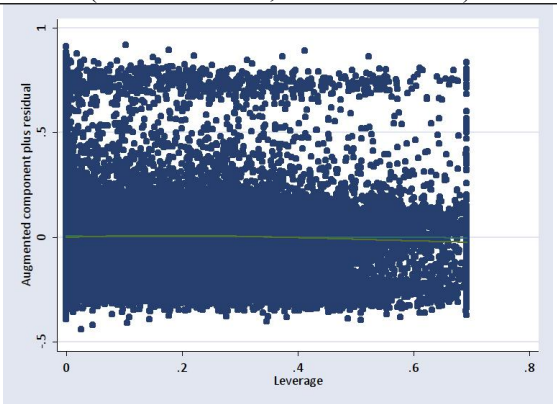
Panel A1 - Augmented Partial Residual Plots
(Y= *GAAP-ETR* ; X = *SIZE*)



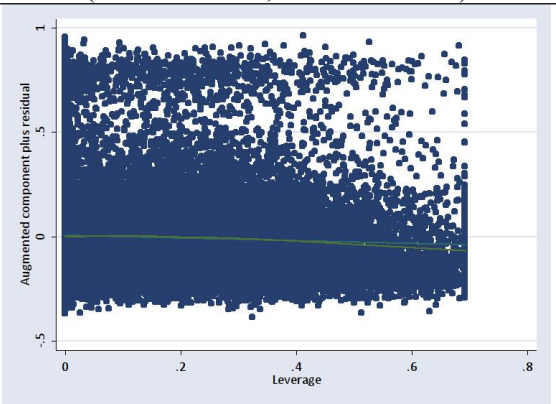
Panel B1 - Augmented Partial Residual Plots
(Y= *CASH-ETR* ; X = *SIZE*)



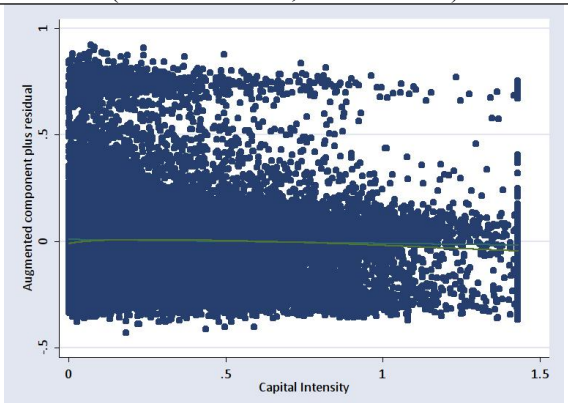
Panel A2 - Augmented Partial Residual Plots
(Y= *GAAP-ETR* ; X = *LEVERAGE*)



Panel B2 - Augmented Partial Residual Plots
(Y= *CASH-ETR* ; X = *LEVERAGE*)



Panel A3 - Augmented Partial Residual Plots
(Y= *GAAP-ETR* ; X = *CAPINT*)



Panel B3 - Augmented Partial Residual Plots
(Y= *CASH-ETR* ; X = *CAPINT*)

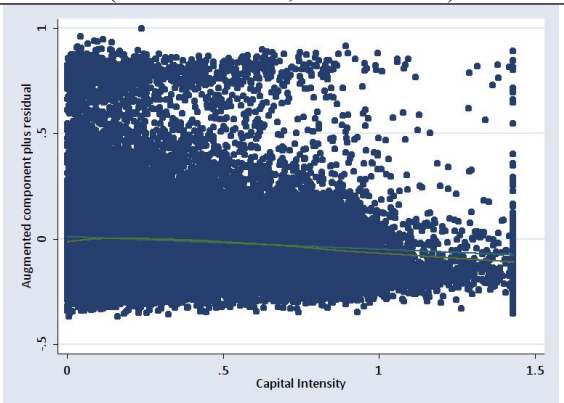
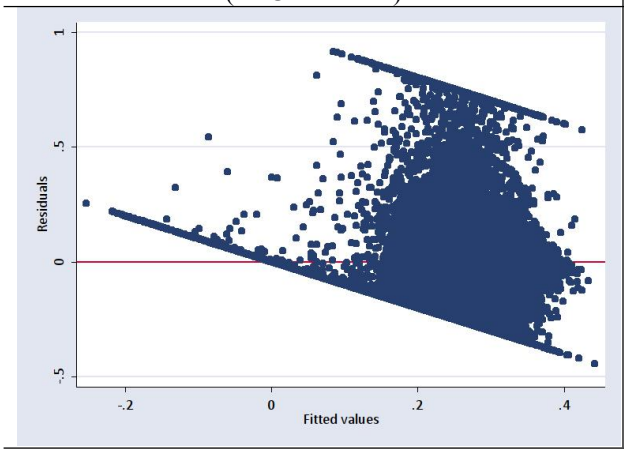
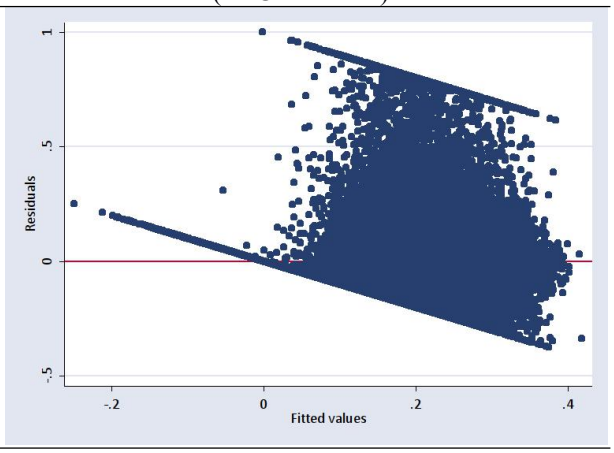


Figure B3 - Fitted Value-Residual Plot

Panel A - Fitted Value - Residual Plot (Y=*GAAP-ETR*)	Panel A - Fitted Value - Residual Plot (Y=*GAAP-ETR*)
	

References

Armstrong, C., Blouin, J., Jagolinzer, A., and Larcker, D. 2015. Corporate Governance, Incentives, and Tax Avoidance. *Journal of Accounting and Economics* 60(1): 1-17.

Atwood, T., Drake, M., Myers, J., and Myers, L. 2012. Home Country Tax System Characteristics and Corporate Tax Avoidance: International Evidence. *The Accounting Review* 87 (6): 1831–1860.

Avi-Yonah, R., Sartori, N., and Marian, O. 2011. *Global Perspectives on Income Taxation Law*. Oxford: Oxford University Press.

Badertscher, B., Katz, S., and Rego, S. 2010. The Impact of Private Equity Ownership on Corporate Tax Avoidance. *Harvard Business School Working Papers*.

------, 2013. The Separation of Ownership and Control and Corporate Tax Avoidance. *Journal of Accounting and Economics* 56 (2–3): 228–250.

Baysinger, Barry D., Rita D. Kosnik, and Thomas A. Turk. 1991. Effects of Board and Ownership Structure on Corporate R&d Strategy. *Academy of Management Journal* 34 (1): 205.

Bebchuk, L., and Cohen, A. 2005. The Costs of Entrenched Boards. *Journal of Financial Economics* 78 (2): 409-433.

Bebchuk, L., Cohen, A., and Ferrell, A. 2009. What matters in corporate governance? *The Review of Financial Studies* 22 (2): 783-827.

Berger, P., Ofek, E., and Yermack, D. 1997. Managerial Entrenchment and Capital Structure Decisions. *The Journal of Finance* 52(4): 1411–38.

Boone, A., Karpoff, J., and Raheja, C. 2007. The Determinants of Corporate Board Size and Composition: An Empirical Analysis. *Journal of Financial Economics* 85(1): 66–66.

Bradshaw, M., Liao, G., and Ma, M. 2016. *Ownership Structure and Tax Avoidance: Evidence from Agency Costs of State Ownership in China.* Working Paper.

Brown, K. 2012. *A Comparative Look at Regulation of Corporate Tax Avoidance*. Dordrecht: Springer.

Chan, K., Mo, P., and Zhou, A. 2013. Government Ownership, Corporate Governance and Tax Aggressiveness: Evidence from China. *Accounting and Finance 53* (4): 1029-1051.

Coles, J., and Daniel, N. 2006. Managerial Incentives and Risk-Taking. *Journal of Financial Economics* 79 (2): 431–68.

Coles, J., Daniel, N., and Naveen, L. 2008. Boards: Does One Size Fit All? *Journal of Financial Economics* 87 (2): 329–356.

Daily, C., Dalton, D., and Cannella, A. 2003. Corporate Governance: Decades of Dialogue and Data. *Academy of Management Review* 28(3): 371-382.

Desai, M., and Dharmapala, D. 2006. Corporate Tax Avoidance and High-Powered Incentives. *Journal of Financial Economics* 79 (1): 145–179.

-----. 2009. Corporate Tax Avoidance and Firm Value. *The Review of Economics and Statistics* 91 (3): 537-546.

Donaldson, T., and Preston, L. 1995. The Stakeholder Theory of the Corporation: Concepts, Evidence, and Implications. *Academy of Management Review* 20(1), 65-91.

Dyreng, S., Hanlon, M., and Maydew, E. 2008. Long-Run Corporate Tax Avoidance. *The Accounting Review* 83 (1): 61–82.

Freeman, R. 2010. *Stakeholder Theory: The State of the Art*. Cambridge: Cambridge University Press.

Friend, I., and Lang, L. 1988. An Empirical Test of the Impact of Managerial Self-Interest on Corporate Capital Structure. *The Journal of Finance* 43(2): 271–71.

Garvey, G., and Gordon, H. 1999. Capital Structure and Corporate Control: The Effect of Anti Takeover Statutes on Firm Leverage. *The Journal of Finance* 54(2): 519–46.

Goh, B., Lee, J., Lim, C., and Shevlin, T. 2016. The Effect of Corporate Tax Avoidance on The Cost of Equity. *The Accounting Review* 91 (6): 1647–1670.

Guenther, D., Matsunaga, S., and Williams, B. 2017. Is Tax Avoidance Related to Firm Risk? *The Accounting Review* 92 (1):115-136.

Gupta, S., and Newberry, K., 1997. Determinants of the Variability of Corporate Effective Tax Rates: Evidence from Longitudinal Data. *Journal of Accounting and Public Policy* 16 (1): 1–34.

Hanlon, M., and Heitzman, S. 2010. A Review of Tax Research. *Journal of Accounting and Economics* 50 (2): 127-178.

Harding, L. 2016. What Are the Panama Papers? A Guide to History's Biggest Data Leak. *Guardian News and Media*, 05 Apr. 2016. Web. 04 Feb. 2017.

Jensen, M., and Meckling, W. 1976. Theory of The Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics* 3 (4): 305-360.

-----. 1978. Can the Corporation Survive? *Financial Analysts Journal* 34 (1): 31–37.

Kim, K., and Limpaphayom, P. 1998. Taxes and Firm Size in Pacific-Basin Emerging Economies. *Journal of International Accounting, Auditing and Taxation* 7 (1): 47–68.

Kor, Y. 2006. Direct and Interaction Effects of Top Management Team and Board Compositions on R&D Investment Strategy. *Strategic Management Journal* 27 (11): 1081–81.

Lanis, R., and Richardson, G. 2011. The Effect of Board of Director Composition on Corporate Tax Aggressiveness. *Journal of Accounting and Public Policy* 30 (1): 50–70.

Lind, D., Marchal, W., and Wathen, S. 2011. *Statistical Techniques in Business and Economics*. Boston: McGraw-Hill Irwin.

Linck, J., Netter, J., and Yang, T. 2008. The Determinants of Board Structure. *Journal of Financial Economics* 87 (2): 308–328.

Linn, S., and Park, D. 2005. Outside Director Compensation Policy and the Investment Opportunity Set. *Journal of Corporate Finance* 11 (4): 680–715.

McGuire, S., Omer, T., and Wang, D. 2012. Tax Avoidance: Does Tax-Specific Industry Expertise Make a Difference? *The Accounting Review* 87 (3): 975–1003.

McGuire, S., Wang, D., and Wilson, R. 2014. Dual Class Ownership and Tax Avoidance. *The Accounting Review* 89 (4): 1487–1516.

Minnick, K., and Noga, T. 2010. Do Corporate Governance Characteristics Influence Tax Management? *Journal of Corporate Finance* 16 (5): 703–718.

OECD. 2013. *Addressing Base Erosion and Profit Shifting.* Paris: OECD Publishing.

-----. 2017. *Limiting Base Erosion Involving Interest Deductions and Other Financial Payments, Action 4 - 2016 Update: Inclusive Framework on BEPS, OECD/G20 Base Erosion and Profit Shifting Project*, Paris: OECD Publishing.

Philips, J. 2003. Corporate Tax-Planning Effectiveness: The Role of Compensation-Based Incentives. *The Accounting Review* 78 (3): 847–874.

Porcano, T. 1986. Corporate Tax Rates: Progressive, Proportional, or Regressive. *Journal of the American Taxation Association 7* (2): 17-31.

PricewaterhouseCoopers. 2016. *Worldwide Tax Summaries: Corporate Taxes 2016/17*.

Rego, S. 2003. Tax-Avoidance Activities of U.S. Multinational Corporations. *Contemporary Accounting Research* 20 (4): 805–833.

Renneboog, L., and Szilagyi, P. 2011. The Role of Shareholder Proposals in Corporate Governance. *Journal of Corporate Finance* 17(1): 167-188.

Richardson, G., and Lanis, R. 2007. Determinants of The Variability in Corporate Effective Tax Rates and Tax Reform: Evidence from Australia. *Journal of Accounting and Public Policy* 26 (6): 689–704.

Rosenthal, J. 2011. *Statistics and Data Interpretation for Social Work*. New York: Springer Publishing Company

Salamon, L., and Siegfried, J. 1977. Economic Power and Political Influence: The Impact of Industry Structure on Public Policy. *American Political Science Review* 71 (03): 1026–43.

Stickney, C., and McGee, V. 1982. Effective Corporate Tax Rates: The Effect of Size, Capital Intensity, Leverage, and Other Factors. *Journal of Accounting and Public Policy* 1 (2): 125–152.

Walsh, J., and Seward, J. 1990. On the Efficiency of Internal and External Corporate Control Mechanisms. *Academy of management review* 15 (3): 421-458.

Watts, R., and Zimmerman, J. 1978. Towards a Positive Theory of the Determination of Accounting Standards. *The Accounting Review* 53 (1): 112–34.

Zimmerman, J. 1983. Taxes and Firm Size. *Journal of Accounting and Economics* 5 (C): 119–149.