

The Effect of Board Characteristic and Customer Concentration on Tax Avoidance: The Role of Ownership Structure

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Abstract

This study investigates how board characteristics and customer concentration influence corporate tax avoidance, with particular attention to the moderating role of ownership structure in Chinese publicly listed firms. Four dimensions are considered: director compensation, customer concentration, CEO duality, and board expertise. The research draws on annual report data from 100 firms across different industries in China over the period 2013–2023. Tax avoidance is proxied by the effective tax rate (ETR), while ownership structure is measured by the degree of ownership concentration. To address potential endogeneity between governance mechanisms and tax strategies, the study employs a two-step System GMM estimator. The findings reveal that higher customer concentration and CEO duality are associated with greater tax avoidance, whereas director compensation and board expertise are negatively related to it. Moreover, ownership structure significantly moderates these relationships: concentrated ownership strengthens the effectiveness of board compensation and expertise in reducing tax avoidance, while simultaneously amplifying the impact of customer concentration and CEO duality on increasing it. The novelty of this research lies in integrating multiple board attributes into a single framework, situating them within China's unique institutional and ownership context, and highlighting how governance mechanisms function differently in emerging markets compared to developed economies. These insights contribute to both theory and practice by extending Agency, Upper Echelons, Resource Dependence, Stakeholder, and Political Cost perspectives, and by offering concrete recommendations for policymakers, investors, and boards to improve governance transparency and discourage aggressive tax practices.

Keywords: Board Expertise, CEO Duality, Customer Concentration, Director Compensations, Ownership Structure, Tax Avoidance.

Introduction

Corporate tax avoidance is an important corporate governance issue which affects both firms' financial strategies, stakeholder relationships and regulatory compliance. Recent years have seen a rise in the attention given to the influence of board characteristics on corporate tax strategies (1, 2). These are thought to be important drivers of corporate behavior more widely including decisions on tax avoidance and comprise the following elements: director compensations, customer concentration, CEO duality and board expertise. Using these characteristics, this study evaluates the effect on tax avoidance for Chinese publicly listed companies, in whose ownership structures state-owned enterprises (SOEs) and privately owned firms generate different governance dynamics. In addition, the moderating

effect of ownership structure in the relationship of board characteristics and customer concentration with tax avoidance will be investigated in order to offer a more refined analysis of governance in the Chinese setting. This study is for China because its corporate governance system is quite different from that of developed countries. Some firms are SOEs, while others are privately owned, and the government still owns large shares in some companies. These incentives and constraints are firm specific, especially with regard to their tax strategies (3). Additionally, because of evolving regulations with higher scrutiny on corporate governance and tax compliance in the country, examining how governance mechanisms affect tax avoidance makes it an ideal setting. In addition, China is currently experiencing rapid economic

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growth, and is the world's second largest economy, which inflates the importance that China's corporate governance practices have on the world markets (4). Most of the previous studies are conducted underdeveloped economies like the United States and Europe, where the dispersion of ownership structures is high and the role of state ownership is negligible (5, 6). But China's market is one filled with the prominent hand of SOEs and thus has its own set of governance dynamics influencing how taxes are treated. There is little research into how board characteristics impact tax avoidance in these types of firms and into how ownership structure moderates these effects (7, 8). Focusing specifically on Chinese listed firms, which have developed under the background of completely different institutional and ownership structures from the developed economies, this study attempts to fill this gap by first of all considering ownership structure as an important moderating factor in corporate governance.

Aligning the financial interests of board members with shareholders through director compensations and customer concentration among other things can affect strategic decisions, such as tax avoidance (9). Higher director compensations could cause a more risk adverse behavior, which could reduce aggressive tax governance (10). Additionally, the link between director compensation structures and companies' participation in tax avoidance has been explored in recent studies (11), the significance of these policies remains underappreciated compared to and in contrast with other executive compensation policies. The other critical factor revealed is the concentration of a company's customer base because the level of concentration is either mitigate or exacerbate of tax avoidance practices depending on a company's level of dependency on a few key customers (12, 13). This study intends to examine the interaction between director compensation and customer concentration which, together, informs how these dual elements influence tax avoidance tactics in a corporation.

Another important determinant of the corporate tax strategy is CEO duality, the phenomenon where the CEO is also the chair of the board. Concentrating power in one person may lead to more aggressive tax avoidance in the absence of oversight or more conservative strategies if it adds oversight (14). However, CEO duality is prevalent

in China, especially in SOEs, where government influence can shape, either in hindering or abetting, tax avoidance (15). Additionally, there is another key determinant of corporate tax strategies: board expertise, e.g. in finance and tax law. The board members that have the expertise are more likely to understand the complexity in tax regulations and the risks involved in aggressive tax strategies (16). Where regulatory scrutiny on tax avoidance has risen most is in China, and where this is the case, expert board members can be invaluable in helping to deal with such matters (17).

The relationship between board characteristics and tax avoidance is significantly moderated by ownership structure. Ownership structure influences corporate governance dynamics differently where SOEs function in China's environment with different constraints and incentives than the case of privately owned firms (7, 10, 18, 19). Privately owned firms, e.g., may be more aggressive in their use of tax strategies to maximize shareholder returns, while SOEs (with government oversight) may be less so. Yet, no study has questioned how ownership structure interacts with board characteristics to moderate their impact on tax avoidance in Chinese publicly listed companies. By investigating how ownership structure modifies the effect of board characteristics on tax avoidance, this study will add new insights into how different types of ownership impact governance and tax behavior.

Accordingly, this research seeks to examine how corporate board remuneration, customer or supplier concentration, CEO duality, and board supervision can influence corporate tax avoidance, with consideration of ownership structure as a moderating effect. The uniqueness of this study is that it draws together these governance and ownership variables into a single framework, highlighting the interaction effect with ownership structure, and is examined in a specific institutional environment in China, where state ownership and concentrated ownership generates governance dynamics that are markedly different than developed economies. This offers new theoretical and empirical lessons about how governance mechanisms influence tax strategies, particularly in emerging markets.

The rest of this paper is organized as follows. The research methodology is presented in Section 2. In

section 3, we provide the data analysis and empirical findings. The findings have implications for corporate governance practices and policy making in China, and Conclusions are drawn in section 4 with a discussion of the study's limitations and related research suggestions for studying this topic.

Theoretical Model

This study is based on Agency Theory and Upper Echelons Theory, both theories that enable better understanding of relationships between characteristics of the board of directors and tax avoidance behavior by corporations. According to Agency Theory the conflict of interest between principals (shareholders) and agents (corporate executives and board members) is an inherent asymmetry of firm (20). According to this theory, board characteristics can determine whether agents behave in their own interests more than the interests of the principals to a greater or lesser degree. For example, greater director compensations can aggravate conflicts of agency risk since high salaries enhance personal incentives of board members to invest in tax avoidance in order to maximize personal gains instead of shareholder compliance and transparency (21). Alternatively, significant ownership by board members in the company's shares would harmonize the interests of the board members with those of the shareholders that could counter the discrepancy of aggressive tax avoidance (22).

However, while Agency Theory provides a useful supplement, the Upper Echelons Theory holds that managerial organization outcomes are partially predicted by the characteristics and experience of top executives and board members (23). According to this theory, board expertise and customer concentrators explain corporate strategies such as tax planning and avoidance. Based on the situation, specialized expertise in the board allows for a better understanding of complex tax regulations and leads to a better compliance reporting that can help reduce tax avoidance (24). Furthermore, more thorough examination and deliberation resulting from

customer concentrations are conducive to prudent tax strategy decision making (25). Upper Echelons Theory is integrated to show how the Director's collective knowledge and decision-making processes influence corporate tax behavior. Figure 1 show the theoretical model of the study.

Alongside these perspectives, Resource Dependence Theory, Stakeholder Theory, and Political Cost Theory also offer useful perspectives for understanding board characteristics and tax avoidance. Resource Dependence Theory illustrates that boards are an important identifiable mechanism for acquiring external resources alternative ways to minimize uncertainty. As such, customer concentration and board expertise may be viewed as strategic resources influencing firms' tax disposal. Stakeholder Theory is a further consideration as firms are accountable to owners, but also to a wider range of stakeholders such as regulators, customers, and the public. This is relevant for the evaluation of director pay and CEO duality and subsequent impact on transparency and ethical tax behavior. Political Cost Theory further builds on this concept to explain that firms with higher visibility, or closer ties to the state such as state-owned enterprises in China, may avoid aggressive tax strategies to diminish political scrutiny and reputational damage costs. Integrating these three theories with Agency and Upper Echelons Theory, this study significantly advances our understanding of how governance systems and contextual factors interact in influencing corporate tax avoidance.

Focusing on the overall model as illustrated in Figure 1, it draws upon Agency Theory, Upper Echelons Theory, and complementary perspectives to demonstrate how board characteristics shape corporate tax avoidance. The model specifies the direct effects of directors' remuneration, customer concentration, CEO duality, and board expertise on tax avoidance, as well as the moderating effect of ownership structure. The figure depicts how theoretical concepts are identified and operationalized into testable hypotheses in the Chinese institutional environment.

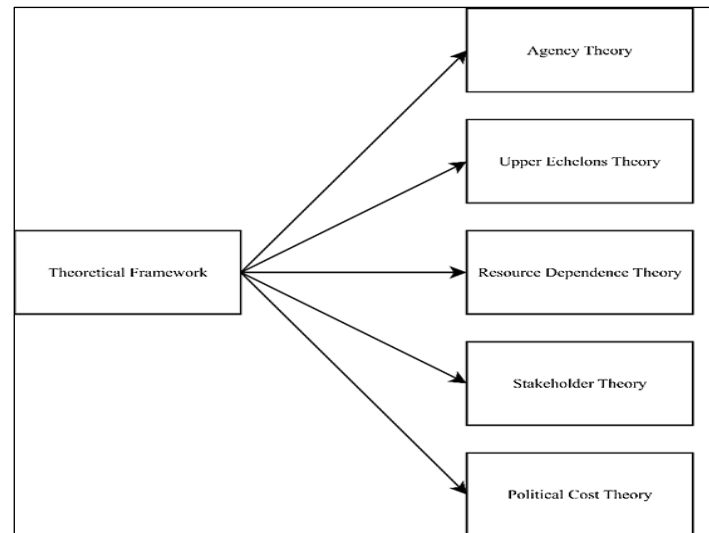


Figure 1: Theoretical Framework

Director Compensations and Tax Avoidance

At the forefront of recent corporate governance research on director compensation (DC) and tax avoidance is an examination of how compensation structures affect the process by which directors make decisions about tax strategy. Further, researchers discover that higher director compensation are positively related to higher tax avoidance, implying that when directors are well compensated, they may favor personal financial gains over rigorous tax conformity (26). Consistent with Agency Theory, higher compensation worsens agency conflicts, inducing board members to participate in aggressive tax planning to increase firm profitability and serve their own remuneration (27). Other researchers similarly showed that large board salaries increase the likelihood of complicated tax avoidance schemes, since the directors are motivated to increase after tax earnings at the cost of long-term corporate sustainability and ethical standards (28).

Conversely, however, emerging research points to conditions in which higher board salaries do not necessarily increase tax avoidance and may, in fact, promote tax compliance. According to past study (11), the issue of offering higher director pay comes down to incentives. Their study finds that when board compensation is linked to performance metrics encompassing ethical conduct and compliance, higher director salaries in turn encourage them to pursue more open and accountable tax behavior. Moreover, researchers also stress the utility of transparent and performance aligned compensation structure in discouraging tax avoidance through creation of a

culture of accountability and directing the interests of directors, in line with those of shareholders. This view is further supported by past study (28, 29), who have shown comprehensive governance frameworks which consist of fair and transparent board compensation diminishes agency conflict and deters aggressive tax strategies. Taken together, these studies suggest that, given the broader governance context, compensation associated with ethical and long term performance goals, has a bearing on tax avoidance.

H1: DC has a negative effect on TA.

Customer Concentration and Tax Avoidance

Recently, such returns have been influenced by the extent of customer concentration. Having high customer concentration (CustCon) usually implies that a firm derives a significant portion of its revenues from a few, relatively disproportionate number of customers, which tends to affect its financial strategies, and risk management practices. In the past, researchers found that firms with concentrated customer bases may try to be more aggressive in tax avoidance to maximize profit and please their important stakeholders (30, 31). This behavior is direct result of the pressure placed on the supplier by the need to preserve good relations with biggest customers, which chases over prioritizing regulatory compliance in the long run over the short run financial gains. The research in the past further confirms that high customer concentration reduces transparency and increases earnings management opportunities,

which in turn increases the opportunity for tax avoidance (13).

However, other scholars have suggested that customer concentration can also serve as a discouragement for excess tax avoidance in the face of growing attentiveness, and accountability among major clients. In the case of past study (32), companies with a diversified customer base tend to practice ethical tax because they also have a higher level of stakeholder oversight and reputational risks. Additionally, researchers find that a diversified customer portfolio may help firms improve their governance mechanism (33), further decreasing the incentive to engage in aggressive tax planning. Customer concentration induces an increase in tax avoidance. However, the existing literature postulates the necessity to elaborate the subtle balance between corporate tax strategies and customer dynamics and to suggest more focused regulatory policies and governance rules.

H2: CustCon has a positive effect on TA.

CEO Duality and Tax Avoidance

Studies have suggested that CEO duality (CD) can, indeed, have substantial effects on the tax planning behaviors of a firm, usually in the direction of more aggressive tax avoidance. Researchers state that CEO duality accumulates decision making power at the expense of the independent oversight and challenging role of the board over managerial decisions (34), such as tax strategies. In Agency Theory, Agency conflicts can increase when executive position is combined, as the CEO can opt for personal and short term financial gains rather than the long term interest of shareholders (35).

On the other hand, certain recent research indicates that the CEO duality effect on tax avoidance might be contingent, depending on other governance mechanisms and the whole regulatory environment. Drawing on past study (36), they argue that such negative effects of CEO duality on tax avoidance can be mitigated in firms that have strong internal controls and a high degree of board expertise. The governance structures that continue to exist allow additional oversight of the tax decisions, even while allowing for roles that are dual. Regulations are also enforced to improve transparency and accountability in corporate decision making and are found to blur the connection between duality of CEO power and tax avoidance (37). Other

researchers further argue that firms with CEO duality are least likely to engage in tax avoidance when working in environments that have an institutional legal environment and enforcement of strict compliance and ethical standards by regulatory bodies (38). Consequently, although CEO duality seems to enhance tax avoidance in general, its effect can be greatly weakened in situations of robust governance frameworks and stringent regulations, suggesting that a multilateral governance approach controls tax avoidance activity.

H3: CD has a positive effect on TA.

Board Expertise and Tax Avoidance

A number of recent studies consistently find that bodies with greater board expertise (BE) on particular matters, especially in finance and taxation are linked to fewer instances of aggressive tax avoidance. As an example, researchers showed that firms with board members having specialized knowledge of finance and tax are more capable of dealing with complex tax laws (39), and in turn have a lower chance of indulging in tax avoidance. Agency Theory suggests informed directors are able to monitor and adjust management actions relative to shareholder interests better (20), and this finding is consistent with that theory. Furthermore, researchers showed that the board expertise helps the board cast a critical eye over the tax strategies which would not only be in conformity with laws but also ethical (40). On the other hand, this increased scrutiny acts to deter excessive tax avoidance and enhances firm transparency and accountability.

However, the relationship between board expertise and tax avoidance is not uniformly positive and is associated with contingent effects. Findings from recent research suggest that the extent to which board expertise can help mitigate tax avoidance is sensitive to the overall governance environment and, in some cases, the need for complementarities in the governance structure. Meanwhile, other researchers suggest that, in firms with a strong internal control and regulatory framework (41), the positive relationship between board expertise and tax avoidance is even stronger. However, highly expert boards also struggle to constrain aggressive tax strategies in settings where governance structures are weak or where regulatory enforcement is absent (16). In addition, the cultural context in which the firm

operates can moderate the relation between board expertise and tax avoidance. For instance, in China, evolving regulatory standards and rising interest in corporation governance transparency have made expert boards in charge of tax practices more successful (42).

H4: BE has a negative effect on TA.

Ownership Structure as Moderating Variable between Board Characteristic's, Customer Concentration and Tax Avoidance

The importance of ownership structure (OS) in moderating the relationship between board characteristics and tax avoidance is established in the sense that it influences the extent the board characteristics can control corporate tax strategies. It has been found lately that the concentrated ownership concentrates the ability of shareholders to oversee and regulate managerial actions such as tax avoidance. In the past, researchers reveal that director compensations can be more effective in reducing tax avoidance in firms with concentrated ownership because of more powerful monitoring and alignment of the interests between major shareholders and board members (43). In addition, researchers showed that concentrated ownership exacerbates the well documented negative relationship between board expertise and tax avoidance (26). Under concentrated ownership structures, this alignment mitigates agency conflicts so board decisions are closely aligned with shareholders' interests, and long-term corporate sustainability (44).

Therefore, ownership structure of the firm, by moderating the firm characteristics, can weaken the influence of board characteristics on tax avoidance, especially in dispersed ownership firms. Such dispersed ownership traditionally results in fragmented shareholder interests, limiting the board's capacity to deliver concise governance strategies. As such environments, that debate and rally to support less aggressive tax avoidance will remain difficult, even with highly compensated or expert boards (45). Furthermore, in line with, dispersed ownership helps decrease the effect of firm CEO duality and customer concentration for avoiding taxes, because the dispersed nature of ownership can make it difficult for customer and CEO duality to monitor and enforce tax policies in a consistent way (46). This implies that the impact of board characteristics on

tax avoidance is critically conditioned by the underlying ownership structure, and that concentrated ownership improves governance outcome while dispersed ownership hampers it.

In the theoretical sense, ownership structure moderates the relationship between board characteristics and tax avoidance, since ownership structure provides the incentives and constraints in which, boards exercise. In concentrated ownership firms, dominant shareholders can monitor more closely, director incentives can be aligned to the long-term goals of the organization, and management can be constrained in their discretion regarding tax decisions. In this case, board characteristics like compensation schemes and expertise take on an even greater role in reducing tax avoidance. Conversely, in dispersed ownership firms, fragmented shareholder interests dilute any minor incentive monitoring and boards are more susceptible to agency conflict. In this case, characteristics such as CEO duality or customer concentration can strongly affect tax avoidance due to less shareholder control over the actions of the board. At this level, ownership structure becomes a governance environment that conditions if board characteristics are either effective monitors or facilitate managerial opportunism.

H5: OS play a moderating role between DC and TA.

H6: OS play a moderating role between CustCon and TA.

H7: OS play a moderating role between CD and TA.

H8: OS play a moderating role between BE and TA.

Methodology

Research Model

A research model highlighted the graphical representation of the proposed association among the variables. The systematic research method has acknowledged the primary objective and methodological integration of these objectives to find empirical results. The research model of the current study demonstrates explanatory variables like director compensation, customer concentration, CEO duality, and board expertise, and the dependent variable is tax avoidance. Furthermore, the research model shows the moderating effect of ownership structure. Therefore, the research model is displayed in Figure 2. Figure 2 shows a schematic presentation of the research model that illustrates the

hypothesized relationships between the variables. The figure is a visual representation of the four independent variables, tax avoidance as the dependent variable, and ownership structure as a

moderating variable. The inclusion of the figure simplifies understanding the structural relationships tested empirically and provides a visual summary of the study's overall design.

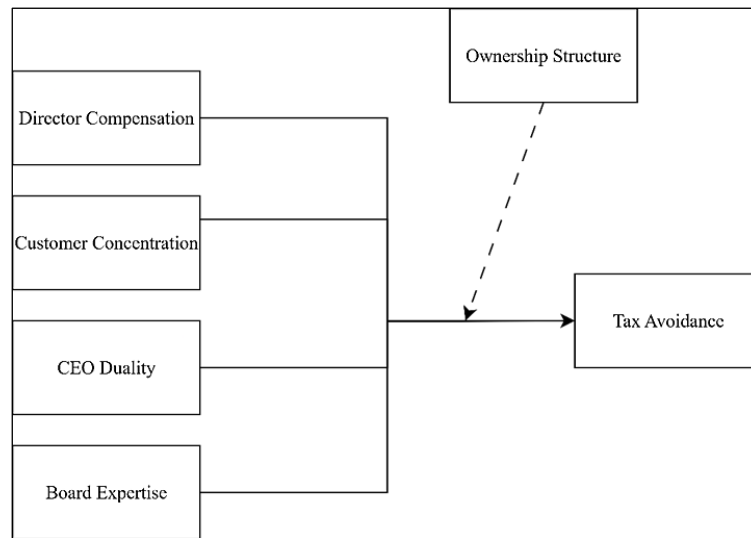


Figure 2: Research Framework

Data and Measurements

The current study investigates the effect of director compensation, customer concentration, CEO duality and board expertise on tax avoidance. Moreover, it examines the moderating role of ownership. The data for ten years, from 2013 to 2023, was collected from annual reports of 100 publicly listed companies across different industries in China. The study's explanatory variables include director compensation, customer concentration, CEO duality and board expertise; the dependent variable is tax avoidance, and the moderating variable is ownership structure. In this study, the operationalization is carried out using four key dimensions: director compensation, customer concentration, CEO duality, and board

expertise. These dimensions were chosen, as they capture structural and behavioral purposes in the board influence on corporate decisions. There are other dimensions discussed often in past research, more specifically board independence, gender diversity, and board size. However, these dimensions are excluded here so that the four dimensions mentioned earlier can focus on the strongest relationship to monitoring effectiveness, pointing at strategic discretion, or technical capacity related to tax decision. Doing this, we can better examine how the particular board mechanisms work with ownership structure in terms of external influence tax avoidance pattern. The description and measurement of this variable are displayed in Table 1.

Table 1: Description and Measurement of Variables

Variables	Abv.	Description and Measurement
Tax Avoidance	TA	The level of a firm's use of legal approaches to reduce its tax bill, measured using the Effective Tax Rate (ETR), calculated as total tax expense divided by pre-tax accounting income. ETR is employed as the main proxy because it captures the overall aggressiveness of firms' tax strategies while remaining consistent with prior tax avoidance research
Director Compensation	DC	Salaries, bonuses, stock options and other incentives owed to the board of directors, measured by total compensation per director
Customer Concentration	CustCon	A measure of the extent to which a firm's revenues are reliant on a small number of customers, measured by HHI.

		The index is computed using the revenue share of the firm's top clients, thereby reflecting the degree of dependence on concentrated customer relationships
CEO Duality	CD	Does the CEO also sit as Chairperson of the Board, measured by binary variable
Board Expertise	BE	All of the collective knowledge and skills of the board members that are useful for the firm, measured by specific knowledge and skills of board
Ownership Structure	OS	Ownership distribution by class of shareholder, measured by concentration of ownership

Econometric Model

The GMM estimation model works well with large sample sets and short time spans. Multiple previous probable occurrences of the error term may be used as independent variables, and system GMM removes the fixed effects of heteroscedasticity and autocorrelation among the variables. In the past, researchers employed different instruments in the context of system GMM (47, 48). It was thought that there was no association between fixed effects and initial discrepancies in instrumental variables. As a result, the model may incorporate additional tools. Other researchers claim that Blundell and Bond's GMM instruments differ from those utilized in the Arellano and Bond method (49). Furthermore, they felt there was no implicit relationship between changes in the initial values of instrumental variables and fixed effects. As a result, the model may incorporate more instrumentation. A fundamental assumption is that it lacks serial correlation. Researchers identified that it may arise with first-order serial correlation; it is not a supplemental instrument and requires delays of three or more periods (50). Extended

delays are required for second-order correlation. Other researchers emphasize the importance of addressing the first difference transformation (51), which separates previous observations from current ones, resulting in bigger data gaps. Consequently, it influences the predicted value. The instruments' fixed effects, along with their presentation as uncorrelated, force System GMM to adapt them. Extra instruments are utilized to examine both the lagged dependent variable and any endogenous factors to account for endogeneity. This dramatically increases efficiency. In contrast to differentiated GMM, which discards past data, System GMM takes into account the mean of all future observations rather than the present values of the relevant variables. This research employed a two-step System GMM to determine the relationship between the dependent and explanatory variables. GMM is purposefully designed to avoid diagnostic testing while addressing endogeneity, autocorrelation, and heteroscedasticity. Our results, however, were shown to be endogenous. As a result, the most effective way to detect and correct endogeneity is to use a system GMM. Furthermore, the fundamental model is as follows:

$$TA_{t-1} = \beta_0 + \beta_1(DC_{t-1}) + \beta_2(CC_{t-1}) + \beta_3(CD_{t-i}) + \beta_4(BE_{t-1}) + \epsilon_{it} \quad \dots \quad [1]$$

To illustrate the use of a GMM estimator in a model using dynamic panel data, consider the following:

$$TA_{ct} = \beta_0 + \gamma(TA)_{ct-1} + \beta_1(DC)_{ct} + \beta_2(CC)_{ct} + \beta_3(CD)_{ct} + \beta_4(BE)_{ct} + \mu_{ct} \quad (\text{Model 1}) \quad \dots \quad [2]$$

$$TA_{ct} = \beta_0 + \beta_1(DC * OS)_{ct} + \beta_2(CC * OS)_{ct} + \beta_3(CD * OS)_{ct} + \beta_4(BE * OS)_{ct} + \mu_{ct} \quad (\text{Model 2}) \dots [3]$$

Note: β_0 represents the "constant-term," whereas β_t represents the "explanatory variable coefficients. DC_{ct} , CC_{ct} , CD_{ct} , BE_{ct} , and OS_{ct} is a moderating variable in the model's explanatory variables, where u is an i.i.d. error term. In this research study, we chose the conduct and specification of the estimator with the limitations posed from standard panel methods in mind.

Random-effects and fixed-effects estimates are common in studies of governance, but they may yield biased estimates in which explanatory variables are included that are endogenous to the conditional tax avoidance behavior. The ownership structure and board composition, for example, could influence tax planning methods, while those same tax planning methods may be

endogenous to the ownership and board composition relationship. Accordingly, this study specified a two-step System GMM estimator which treats endogeneity, autocorrelation, and heteroscedasticity. Our application was also validating checking for endogeneity.

Results

Descriptive Statistics

Table 2 presents the characteristics and distribution of six variables: TA, DC, CustCon, CD, BE, and OS. The mean value for TA is equal to 1.964; the median is slightly higher, which can point to the distribution shift to the values lower than the arithmetic mean. The performance of TA is almost aligned with the average of the overall DC, showing that both of these variables work almost similarly. The mean value of CustCon is negative, while the median is 0.055, which points to negative skewness, meaning the extreme negative outliers depressed the mean value. The range is wide, particularly on the negative side, which provides evidence of the negative mean and a relatively moderate median for the other variables. The standard deviations are still larger, further enhancing the variability with the CustCon variable and supporting the presence of outliers. The CD is the largest, with a mean of 3.020, and

departs slightly from a normal distribution, as seen in the histogram's shape with a slightly negative skewness. The range is the highest relative to the maximum a, lowest the minimum, and irately negative. Moderate variability is lower than BE's, suggesting that the values are concentrated in the middle. The variables also differ with regards to their dispersion from the mean, as measured by their standard deviation and range or between highest and lowest values: BE has the greatest 'spread' and variability together with the highest SD and range, as well as you and north: it also has very significant outliers on the positive as well as on the negative side. This is demonstrated by the following results: Parameter estimate: A value for the OS variable has a higher mean, revealing large average values. The median is less than the mean also, positive skew shows that more values are less than the mean. Therefore, the data in Table 2 suggests descriptive statistics for the six variables being studied in terms of their characteristics and distributions. BE has the largest frequency distribution and variance with the highest standard deviation and, finally, the highest range of variation. However, TA and DC are more consistent and have smaller fluctuations with the lowest standard deviations and narrower ranges.

Table 2: Results of Descriptive Statistics

	TA	DC	CustCon	CD	BE	OS
Mean	1.964	1.961	-0.118	2.736	1.121	2.675
Median	2.142	2.147	0.055	3.020	1.129	2.177
Max	3.128	3.142	1.814	3.901	4.172	2.277
Min	-0.044	-0.056	-6.098	-1.797	-4.365	-1.955
Std. Dev.	0.681	0.671	0.972	0.762	1.869	1.106

Correlation Matrix

Table 3 presents a correlation matrix for six variables: TA, DC, CustCon, CD, BE, and OS. The correlation values are between - 1 and + 1, and 1 represents a positive correlation, perfectly negative correlation, and 0 means no correlation at all. The study's general findings are a negative and weak association between TA and DC, a positive and weak association between TA and CustCon, and almost no association between TA and CD. At the same time, a negative and weak association exists between TA and BE, and a positive and weak association exists between TA and OS. The trends of the correlation between the different acronyms are as follows: DC and CustCon show a positive and rather weak correlation, whereas there is an

inverse correlation between CustCon and BE or between DC and OS; not much correlation exists between DC and BE; and finally, there is a weak negative correlation between DC and OS. In other words, values of the coefficient of positive correlation show that CustCon and CD variables increase more forcefully than the other pairs. Our calculations, which yielded a weak negative correlation, indicate that CustCon and OS are fairly independent. Analyzing the correlation between CD and BE, the value obtained is 0.338, which indicates a relatively high positive correlation between CD and BE. An insignificant negative relationship between CD and OS shows that OS decreases as CD improves slightly. A very low but positive correlation between BE and OS suggests

that both know the slightest direction. From the correlation matrix above, the difference between

these variables is weak to moderate, and no strong positive or negative correlation prevails.

Table 3: Results of Correlations Matrix

	TA	DC	CustCon	CD	BE	OS
TA	1					
DC	-0.308	1				
CustCon	0.254	0.229	1			
CD	0.115	-0.173	0.470	1		
BE	-0.053	0.003	0.418	0.510	1	
OS	0.121	-0.181	-0.079	-0.291	0.198	1

Heteroscedasticity and Autocorrelation

Table 4 shows the results of the Wald and Wooldridge tests. The Wald test rejected the null hypothesis of homoscedasticity, demonstrating the existence of heteroscedasticity. The present study rejects the null hypothesis since the statistic value of the Wald test is significant at 1% of the

significance level (64.919***), indicating the absence of group wise heteroscedasticity. The Wooldridge test was employed to conduct an autocorrelation diagnosis. Therefore, the present study rejects the null hypothesis since the statistical value of the Wooldridge tests is significant at 1% of the significance level (178.526***), indicating the presence of autocorrelation in the panel.

Table 4: Heteroscedasticity and Autocorrelation

Test	Stat.	Ho:
Wald test statistic	64.919***	Rejected
Wooldridge test for autocorrelation	178.526***	Rejected

Multicollinearity

Table 5 shows the findings of the multicollinearity research performed using the VIF test. The VIF test

results showed no evidence of multicollinearity, with an average VIF score of 2.216.

Table 5: Results of Multicollinearity (VIF Test)

Variable	VIF	1/VIF
DC	3.106	0.322
CustCon	3.205	0.312
CD	2.701	0.370
BE	2.240	0.446
OS	2.127	0.470
Mean VIF	2.676	

Endogeneity Test

All components, whether endogenous or exogenous, must be identified before doing system GMM analysis. Endogenous means that two variables are reliant on one another rather than

independent. Table 6 shows that the dependent variable Granger is the only independent cause of all endogenous independent variables. In this study, all independent variables are considered endogenous. Therefore, the present study employed a system GMM estimation model.

Table 6: Results of Endogeneity Test (Dependent variable is Ln TA)

Independent Variables	Z-bar	Z-bar tilde
DC	15.585***	11.259***
CustCon	18.596***	13.619***
CD	10.511**	8.905**
BE	8.589**	7.959**

A significance threshold of 1% should be established. Dumitrescu and Hurlin introduced the null hypothesis in their study. The Granger non-causality test uses a dependent variable (Granger) to generate an independent variable.

System GMM Estimation Results

Table 7 shows the system GMM estimate results. As a result, the lag in tax avoidance has a positive and statistically significant impact on tax avoidance. The results (coefficient = 0.316, t-statistic = 2.067, and $p < 0.05$) at a 5% significance level. Further, director's compensation has played a significant role in reducing tax avoidance. The results (coefficient = -0.266, t-statistic = -2.219, and $p < 0.05$) at a 5% significance level support the first hypothesis. The results of this study are consistent with earlier investigations (52–54). Furthermore,

customer concentration has played a statistically significant role in increasing tax avoidance. The results support the second hypothesis at a 5% significance level (coefficient = 0.125, t-statistic = 2.458, and $p < 0.05$). This investigation is consistent with past studies (13, 32). In addition, tax avoidance has increased statistically significantly due to CEO duality. The findings confirm the third hypothesis at a 5% significance level ($p < 0.05$), a t-statistic of 2.156, and a coefficient of 0.229. Previous research supports this study (34, 55). Moreover, tax avoidance has decreased statistically significantly due to the board's expertise. The findings confirm the third hypothesis at a 10% significance level ($p < 0.10$), a t-statistic of -1.823, and a coefficient of -0.173. Previous research supports this study (16, 39)

Table 7: Results of GMM Estimation (Model 1)

	Coefficient	Std. Error	t-Statistic	Remarks
TA (-1)	0.316	0.153	2.067**	Supported
DC	-0.266	0.120	-2.219**	Supported
CustCon	0.125	0.051	2.458**	Supported
CD	0.239	0.111	2.156**	Supported
BE	-0.173	0.095	-1.823*	Supported
C	0.160	0.066	2.428	

Moderating Effect

Table 8 displays the findings of the moderating effect of ownership structure. Therefore, the ownership structure has significantly moderated the association between director compensation and tax avoidance relationship. The findings confirm the fifth hypothesis at a 1% significance level ($p < 0.01$), a t-statistic of -2.875, and a coefficient of -0.368. Moreover, the ownership structure has significantly moderated the association between customer concentration and tax avoidance relationship. The findings confirm the sixth hypothesis at a 1% significance level ($p <$

0.01), a t-statistic of 2.929, and a coefficient of 0.346. Further, the ownership structure has significantly moderated the association between CEO duality and tax avoidance relationship. The findings confirm the seventh hypothesis at a % significance level ($p < 0.01$), a t-statistic of 3.554, and a coefficient of 0.401. Finally, the ownership structure has significantly moderated the association between board expertise and tax avoidance relationship. The findings confirm the eighth hypothesis at a % significance level ($p < 0.01$), a t-statistic of -2.988, and a coefficient of -0.296.

Table 8: Results of GMM Estimation (Model 2: Moderating Effect of Ownership Structure)

Variable	Coefficient	Std. Error	t-Statistic	Remarks
DC*OS	-0.368	0.128	-2.875***	Supported
CustCon *OS	0.346	0.118	2.929***	Supported
CD*OS	0.401	0.113	3.554***	Supported
BE*OS	-0.296	0.099	-2.988***	Supported
C	0.288	0.093	3.110	

Discussion

The results from this study should be contextualized against the institutional regulatory environment in China. The corporate tax enforcement regime in China has been tightening for over a decade, with ramped up scrutiny by the State Taxation Administration and the imposition of increased penalties for non-compliance. With respect to disclosures, there have also been increased disclosure regulations compared to standard disclosures for overseas listed firms regarding related party transactions and tax obligations. Concurrently, laws and regulations on corporate governance explicitly state that independent directors and oversight from boards of directors are key mechanisms of corporate governance, yet the degree to which compliance can be enforced varies across state owned enterprises and privately owned enterprises. The institutional situation discussed in this section can help explain variations in tax avoidance in this study: firms that are subject to heightened regulatory scrutiny and disclosure may experience decreased incentives for aggressive tax planning, but firms that are subject to less governance enforcement, or that are politically connected, can take the opportunity to exploit tax saving measures. The discussion above positions the results in this study within an institutional framework that contextualizes how regulatory institutional factors influence how board characteristics and ownership characteristics are effective at shaping tax behavior.

Furthermore, the current study provides empirical evidence that directors' compensation significantly affects tax avoidance. This study indicates that swings in tax avoidance are related to the board of directors' compensation. The present study supports the first hypothesis that compensating the board of directors for aligning their goals with taking advantage to control tax avoidance. The extra compensation the board of directors receives reduces the level of tax avoidance (52–54). Therefore, the findings of this study are consistent with that conclusion. In addition to tax avoidance, the remuneration of the board of directors encourages them to make appropriate tax calculations according to Chinese regulations for the listed companies.

This research looks at the influence of a company's tax policy and the customer concentration

component of its business plan. A company's proclivity to dodge taxes is influenced by its client concentration, operational efficiency, cash flow risk, and fiscal policies. The need for more liquidity, lower financial volatility, and higher profitability originates directly from the concentration of corporate clients. Tax evasion has immediate and long-term effects on a company's cash flow, financial stability, and profitability because of inconsistencies in declared taxes. A company's tax strategy often reflects its business approach; enterprises that participate in high-risk initiatives by depending on large corporations tend to use equally bold tax strategies. Thus, we claim that businesses that rely heavily on large corporations for income are more vulnerable to tax fraud. The relationship between customer concentration and tax evasion is stronger when a firm's major customers have low switching costs and are difficult to replace. This supports our claim that tax evasion is largely motivated by cash flow and financial concerns associated with customer concentration (13, 32).

The study found that having multiple roles on a company's board of directors, specifically as chief executive officer and chairperson of the board, may increase the usage of tax avoidance policies, which is consistent with the agency theory's view that such practices foster managerial opportunism and that managers use tax avoidance to misappropriate corporate resources for personal gain. Furthermore, consistent with agency theory's assertion that a board-level risk committee alleviates investor concerns about potential management malfeasance, current study findings show that optimize the effect of CEO duality on tax avoidance within the listed companies in China. This finding is consistent with previous research (34, 55), which found that the existence of two top executives enhances tax evasion.

The current study empirically supports existing literature on the importance of knowledgeable and skilled board members in facilitating ethical financial practices and sound corporate governance and presents empirical evidence that board expertise is indeed an important factor in determining tax avoidance. Boards comprising a higher percentage of directors endowed with specialized industry knowledge and advanced qualifications are more effective at monitoring financial reporting and tax compliance, and there

is a lower likelihood of taking aggressive tax avoidance strategies. Additionally, boards with plentiful financial and legal experience put in place more stringent internal controls and create a culture of disclosure to prevent opportunities for tax minimization attempts. An increased board expertise also drives stronger ethical standards and accountability mechanisms that drastically cut the chances of tax avoidance practices. Collectively, previous studies highlight the significant role of board expertise related to reducing the use of tax avoidance in curbing tax avoidance; suggesting that hiring qualified and experienced directors is essential to firm corporate governance frameworks and its adoption of a responsible tax behavior. Our study finding is consistent with previous research (16, 39).

Board compensation is demonstrated to significantly moderate the relationship between ownership structure and tax avoidance, such that concentrated ownership boosts the role of compensation as an effective deterrent to tax avoidance, through a stronger oversight and identically aligned interests between directors and shareholders. On the other hand, in firms with dispersed ownership, the effect of board compensation on the agency problem of tax avoidance is weakened due to the fact that diversified shareholders exercise little influence on board decisions and monitoring. Because of this, asset complementarity occurs among firms with different ownership structures, making which firm ownership structure impacts the effectiveness of board compensation in controlling tax avoidance. The relationship between customer concentration and tax avoidance is moderated by ownership structure specifically, firms with concentrated ownership have greater ability to manage and leverage customer dependencies to either mitigate or engage in their tax avoidance practices. On the other hand, companies whose ownership is dispersed may experience a reduced influence of customer concentration on tax avoidance through weaker monitoring systems and conflict of interest among the larger number of shareholders.

These results have implications for monitoring effectiveness and customer dynamics. If board independence or similar features only diminish tax avoidance in dispersed ownership, this implies monitoring power depends on shareholder

structure. In a dispersed ownership scenario, for example, independent directors may exercise their authority to protect minority shareholders and, in doing so, reduce aggressive tax avoidance; however, in a concentrated ownership setup, controlling shareholders are already the monitor, thus there is less room for the independence of the board to change tax behavior. The link between lower tax avoidance and customer concentration can also be viewed in two ways: contractual pressure versus reputational pressure. For example, firms with large client dependency may wish to avoid aggressive approaches to tax to ensure they meet contractual obligations and retain good long-term client relationships. Alternatively, there may exist reputational damage to the firm if actions are perceived negatively and spill over onto clients. Thus, both economic and reputational incentives encompass how customer concentration influences tax decisions.

CEO duality has significantly effected on tax avoidance across different ownership structures, more often driving dual-role executives to pursue more aggressive tax strategies under concentrated ownerships. Unlike in firms with dispersed ownership, heightened shareholder scrutiny and diverse interests are more likely to undermine CEO duality's effect on tax avoidance in such firms as a result of increased accountability and restricted managerial discretion. Board expertise in enforcing lack of tax avoidance is greatly moderated by the ownership structure, particularly when concentrated ownership enhances knowledgeable board enforcing strict tax compliance and ethical standards. In contrast, in the firms with dispersed ownership, the relation between board expertise and the reduction of tax avoidance tends to become weak, simply because there is less oversight and diverging interests of shareholders with a wider shareholder base hinder the board from taking concerted tax governance actions.

Conclusion

The current study investigates the effect of director compensation, customer concentration, CEO duality and board expertise on tax avoidance. Moreover, it examines the moderating role of ownership. The data for ten years, from 2013 to 2023, was collected from annual reports of 100 publicly listed companies across different

industries in China. It reveals that board compensation has a significant effect on tax avoidance by linking the interests of directors to long term organizational goals and redirecting them to discourage aggressive tax activities. But this effect is strongly related to the ownership structure: concentrated ownership may strengthen the oversight and control mechanisms but may weaken them under dispersed ownership. Furthermore, we find that customer concentration is a key driver of tax avoidance, as firms with larger customers tend to employ more aggressive tax strategies to compensate for the loss of important customers in the event of deterioration, especially when this ownership is heavily concentrated and the strength of control over these dependencies in the ownership structure is strengthened.

Additionally, the results show that CEO duality and board expertise are key vehicles that impact corporate tax strategies and that these governance factors also interact with ownership structure. In firms with concentrated ownership, CEO duality encourages managerial opportunism yet may be less efficient at inducing tax avoidance in firms with dispersed ownership, where managerial opportunism is curbed by growing shareholder scrutiny. As in the case of curbing tax avoidance, board members are also more experienced when the ownership is more concentrated and effective oversight is stronger. Overall, the results of this study suggest that ownership structure should be considered as a moderating factor in regarding board characteristics impact on tax avoidance and that governance strategy for different ownership models need to be appropriately tailored in order to properly tackle the specific governance challenges arising in each case.

Policy Implications and Future Directions

Based on the findings, Chinese policymakers and regulatory authorities in listed companies should transform and reinforce corporate governance mechanisms and subsequently discourage tax avoidance. To this end, it is proposed that policies for transparent and fair director compensation tied to long term organizational goals and ethical standards be implemented, knowledgeable and skilled board members that promote oversight and accountability be appointed, and CEO duality be addressed by advocating for the separation of the role of CEO and board chair to prevent managerial

opportunism. Moreover, based on the moderating role of ownership structure, regulations should be drafted to guarantee higher transparency and accountability even in cases of highly concentrated and dispersed ownership to restrain from abusive tax strategies. Future research should examine other governance factors, or other industries in China, to further understand the dynamics between corporate governance and tax avoidance and help policy makers formulate more effective policies.

In order to meet the objectives above, regulators in China should take steps to improve the disclosure of tax strategies and related-party transactions, particularly in those firms where there is greater customer concentration and CEOs have dual responsibilities as executive officer, as the improved disclosure will increase transparency. The board of directors should have an independent audit and risk committee consisting of people with appropriate levels of tax and finance relevant knowledge to examine and monitor complex tax decisions. The compensation of directors should be linked to firm performance, but not only had to firm performance with appropriate eligibility criteria to meet compliance based on less aggressive tax planning. State-owned enterprises should bring about adjustments to ownership structure which better combat the level of government control versus an independent board. Furthermore, private firms with concentrated owners should be encouraged to adopt better models of shareholder protection. All of these recommendations offer real options for policymakers, boards, and investors to attempt to curb tax avoidance and improve corporate governance structures in emerging markets.

Abbreviations

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Author Contributions

Cai Yun Chen: conceptualization, methodology, software, validation, formal analysis, investigation, resources, data curation, writing – original draft preparation, writing – review & editing, project administration, Funding Acquisition, Saidatul Nurul Hidayah Jannatun Naim Nor-Ahmad: conceptualization, software, formal analysis,

visualization, supervision, Raja Haslinda Binti Raja Mohd. Ali: conceptualization, software, formal analysis, visualization, supervision. Authors have read and agreed to the published version of the manuscript.

Conflict of Interest

The author declares no conflict of interest.

Declaration of Artificial Intelligence (AI) Assistance

The authors declare that no generative AI or AI-assisted technologies (including but not limited to large language models and any text, image, audio, or code generators; grammar/style checkers; or machine translation tools) were used in the conception, drafting, editing, data analysis, figure preparation, or referencing of this manuscript. All content was created solely by the authors.

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