
Corporate Governance Bundles and Corporate Tax Avoidance: A Cross Country Study

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ABSTRACT

Keywords:

Corporate Governance, Governance Bundles, Tax Avoidance, Tax Shelter

This study evaluates the effect of corporate governance in bundles form on tax avoidance at the corporate level. The sample includes all listed firms on CompStat in USA and listed on CompStat global. It covers the period from the fiscal year 2002 to 2018 for developed and developing countries. The sample is 12,832 firm-year observations, after excluding those firms whose financial data was not available. This study has taken quantile regression estimates as the basis for statistical tests and drawing inferences. It is observed that some governance mechanisms are complementary to each other whereas some mechanisms are substitutive to each other while affecting decisions and policymaking related to tax avoidance. Findings of the research reveal that corporate governance bundles influence tax avoidance at a corporate level in all economies through the strength of influence differs from country to country.

INTRODUCTION

Modern business firms operate in the separation of ownership and control. The ownership lies with shareholders while managers manage the business operations. In such a business model, there is always an issue of misalignment of objectives due to information asymmetry. To overcome such issues, corporate governance as a system of monitoring and advice evolved. The misalignment of objectives occurs if certain activities are being performed to gain personal advantages by managers. One of such activity may be corporate tax avoidance. Tax avoidance is permissible activity contrary to tax evasion which uses illegal ways and practices. How does corporate governance at the firm level affect corporate tax avoidance practices is an open research question?

Recently this area of research has gained a significant scholarly attention. Researchers have tried to understand how corporate governance affects the tax management of a corporation. Rego and Wilson (2009) note a positive relationship between compensation and aggressive tax reporting. While no positive relationship between ownership and corporate tax avoidance among US firms was found by Chen et al. (2010). Whereas, the same negative results were observed on Canadian firms by Landry et al. (2013). A study carried out on Australian companies by Lanis and Richardson (2011) on board composition and tax avoidance at the corporate level established a significant negative relationship between them. These varied empirical results are due to core attention on outcomes of "independent" governance structures. These relationships were established in "isolation" between different characteristics of governance and tax avoidance which may have different results over corporate tax avoidance if we see these characteristics of corporate governance collectively. Misangyi and Achar

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(2014) and Aguilera et al. (2012) are of the view that corporate outcomes are influenced intricately and in a multiplex way by various governance mechanisms. Keeping in view the above discussion, this research finds that how these different characteristics of corporate governance, referred to as a bundle of governance mechanism influences corporate tax avoidance (Oh et al., 2016).

By comprehending how corporate governance is related to tax avoidance, this study enriches the understanding of problems in perspective of different measures of governance. Different companies may follow different types of tax management due to different governance structures. As executives and directors have multiple options in spending companies' resources, it is imperative to find that is there any systematic difference exist between the companies which opt for tax management and the companies which choose not to avoid taxes. Secondly, this research helps to understand the dynamics of the relationship between corporate governance bundles and tax avoidance in a more refined manner and in comparison, to the companies operating under varying levels of institutional voids. Additionally, this study contributes to literature and practice of corporate governance and corporate tax avoidance. This research precisely explains that how the different designs of corporate governance mechanisms encourage/discourage corporate tax management. It furthermore enlightens the understanding that how a company could become a better corporate citizen by designing effective corporate governance practices depending on their own circumstances. Moreover, it examines that how various and compound governance mechanisms interactively stimulate a company's tax decisions with the purpose to explain for variations in earlier findings on the relationships between corporate governance mechanisms and tax avoidance at the corporate level. Additionally, majority of prior research on corporate governance has looked at how the inter-reliance of governance mechanisms themselves are structured by investigating whether one mechanism (e.g. board independence) amplifies or reduces the influence and potency of another mechanism (e.g. block-holder ownership) (Zajac and Westphal, 1994; Hoskisson et al., 2009; Schepker and Oh, 2013). Ratu and Siregar (2019) find corporate governance mitigates the tax avoidance. Chytis et al. (2018) also worked on the relationship of corporate governance and tax avoidance but their study was limited to Greece. They suggested that this relationship should be examined on different countries by using different proxies of corporate tax avoidance. Moreover, they suggested that adding more firm characteristics can change this relationship. This study, however, adds in literature by illuminating how governance bundles interactively generate results of organizations.

The rest of this study is organized as follows. In section 2, the study reviews the related literature while section 3 explains data and methodology. Section 4 presents the findings of the study. Finally, section 5 discusses the conclusion of the results.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

The research gap in the literature, due to different results in different countries, roused a sequence of researches that closely and forthrightly study the factors affecting corporate tax avoidance. For instance, Dyreng et al. (2010) found substantive statistics about the managers who were earlier employed in tax avoidance firm appear to carry forward the same attitude towards tax avoidance in their new firms. This aggressive tax avoidance, inclining towards non-compliance of corporate, are the product of tax reporting rewards catered by managers' reward-based contracts (Chen and Chu, 2005). Coherent to this conception, Phillips (2003), Rego and Wilson (2012) and Armstrong and Vashishtha (2012) find an empirical relationship between tax avoidance endeavours and rewards-compensation thereof.

An elaborative study was carried out by Bhagat and Bolton (2008) on governance and performance, employing compound determinants of governance and also individual determinants. A positive relationship was found between governance qualities and enhanced present and future performance of managers. Nevertheless, a robust relationship between corporate governance and corporate performance is still observed by them. What is still to be found is that which specific governance constituents are urging the managers towards tax management. However, subsequent literature illustrates that there may be a feeble relationship between board composition and board performance. It was found by Bhagat and Black (1999) that boards with a small number of members having a larger proportion of outside directors are not essentially associated with the firm's credible performance. Coles et al. (2008) come across the notion that actually, boards are dependent on characteristics of the firm. Less studies have been carried out to find particularly that either corporate governance influences corporate tax avoidance or not and if yes then how it does. For this, Desai and Dharmapala (2006) construct a model which ties equity-based compensation of corporate managers to assertive corporate tax avoidance. They infer the presence of correspondence between tax sheltering and rent-seeking activities. The core spirit of their research is that directors of efficiently governed companies will have more reasons for avoiding corporate tax because extracting rents will be difficult for them, which are produced from directors' corporate tax avoidance activities, due to the presence of other governance mechanisms.

Graham and Tucker (2006) have found that tax planning in the eyes of shareholders is a value-enhancing activity. Furthermore, Desai and Dharmapala (2006) observe the same that shareholders do value tax avoidance. If tax management is considered a value-enhancing activity, firms are keen to engage in tax management. Although companies are interested in tax management because it improves the financial strength of the firm, it is also pertinent to identify the cost allied to desire of investing resources in tax management. The same resources being used for tax planning can be invested in some revenue generating venture or project. The research by Scholes et al. (2009) indicates that there are some other costs like implicit taxes, uncertainty, and transaction costs as well in addition to opportunity costs for using the capital for tax planning. However, the companies will take on tax planning only in case of the presence of net benefit.

A number of studies, like Vafeas (2010), Minnick and Noga (2010) and Lanis and Richardson (2015) have reported the existence of a relationship between characteristics of board and corporate tax avoidance. However, researchers like Hoskisson et al. (2009) and Schepker et al. (2018) do not advocate the assumption that each mechanism of governance operates independently. Especially they suggest that all governance mechanisms are not the same although they aspire and work for the same goal of reduction in agency cost at maximum level. Leaving the basic assumption of "independence", this study puts forward the assumption that company's performance results can be dependent on its governance bundles mechanisms. Therefore, for better understanding and explanation of the effect of a group of particular governance mechanisms on firm's results, it is imperative to take into account the other interconnected governance instruments (Oh et al., 2016). The research literature on corporate governance mechanisms pertaining to tax avoidance appears fragmented so far. On the one hand, a group of research study finds a positive relationship between various governance mechanisms, whereas, on the other hand a negative relation is found in another country. This clears fragmentation in results calls for an extensive and in-depth study on the relationship between various corporate governance bundles and corporate tax avoidance. It is imperative to understand how this relationship and its mechanism work in international settings by carrying out a comprehensive and comparative study between developing and developed countries.

Complementing Bundles Hypothesis

As per many studies, effective monitoring like Bates et al. (2008) and Chen et al. (2013) and incentive affiliation like Armstrong et al. (2012) and Kock et al. (2012) are related to tax avoidance. It is interconnected to the self-interest of corporate managers, where they would prefer to save resources at one end to demonstrate their performance and on the other end, reward and incentives based on their performance. It would continue unless corporate managers are effectively governed and appropriately implemented (Huseynov and Klamm, 2012). Therefore, strong governance tends to persuade corporate managers for the tax policies of the firm.

In the context of this study, this theory entails that in the presence of one governance practice, the marginal benefit of other governance mechanisms on tax management would enhance, thus complementing effect would prevail by both mechanisms. The concept of “complimenting effect” proposes that through combined effect, governance mechanisms turn out to be additionally beneficial (Aguilera et al., 2008). The management puts more effort for corporate tax management in a most advantageous manner without compromising the reputation of firm, once continuous monitoring and long-term incentives are rewarded to management and board (Deckop et al., 2006). It also reduces the severity of agency problem and trims down the requirement of third-party monitoring. Hillman and Dalziel (2003) explain that independent board functions in both ways i.e. monitoring function and resource provision function. Thus, here, information and control mechanisms of management are complimenting each other. Oh et al. (2016) also found that a composite set of governance practices intricately pose an impact on their firms. In the same lines, it is proposed that multiple governance mechanisms have a relationship with corporate tax avoidance in developed and developing economies.

H1: There are complimentary effects of corporate governance bundles on corporate tax avoidance.

Substitutive Bundles Hypothesis

A substitutive bundle is another proposed hypothesis. It says that corporate governance practices and mechanisms ‘substitute’ to each other in managing corporate tax or deciding about corporate tax avoidance. In the context of resource allocation for governance decisions like saving financial resources by tax avoidance, hiring tax consultants and experts for tax management, incentives alignment for this, an investment decision of those saved resources, as such, there is involvement of cost-benefit analysis to achieve beneficial trade-offs (Hairul et al., 2014). Further, there is a possibility of diminishing benefits (Zajac and Westphal, 1994) while employing multiple governance mechanisms for corporate tax avoidance. All preceding arguments mentioned above suggest that specific governance practice may act as substitutes instead of complimenting to each other in the interest of the organization.

Thus, if companies decide to add any governance mechanism, like incentive alignment or continuous monitoring for tax management, while other practices of governance also existent, there is the possibility of overweighing cost due to implementation of the additional instrument of governance, as per substitutive viewpoint. In such circumstances, employing multiple governance practices will not benefit in managing tax or even it may move on the negative side. This substitutive bundle view has been empirically supported by some of the researchers (Randoya and Goel, 2003; Oh et al., 2016). They found that the presence and practice of one governance mechanism lead to non-requirement of other mechanisms. Randoya and Goel (2003) contended that in family firms, many of governance mechanisms are not that efficient. It was observed in their study that as in family firm’s principal-agent issues are absent, therefore increased monitoring system or incentive alignment would not be effective in such

cases. Besides, it would also not increase performance and resources of the firm. Taking all arguments together, it is proposed that there is a possibility that multiple governance mechanisms may work substitute in planning and managing corporate tax avoidance.

H2: There are substitutive effects of corporate governance bundles on corporate tax avoidance.

DATA AND ECONOMETRIC METHODS

Sample and Data

The sample includes all listed firms of selected developed and developing countries on CompStat global. It covers the period from the fiscal year 2002 to 2018 for developed and developing countries. The reason behind choosing this particular time was that for most of the firm's data was not available before financial year 2002. The criteria of selection were the availability of data of those firms whose could compute tax avoidance measure(s) (amongst the measure defined in table 1). Then data was merged that was obtained from board Ex by using common identifiers. Finally, sample of 12,832 firm-year observations was obtained after excluding those firms whose financial data was not available. This study taken quantile regression estimates as the basis for statistical tests and drawing inferences. This method caters the need for the proposed hypothesis by dealing with the distribution of tax avoidance at its extreme ends. As compared to OLSR (ordinary least squares regressions), quantile regression provides room to draw wide-ranging comprehensive inferences further than those which are described by OLSR. Quantile regression explains the correlation and association between the independent variable(s) and dependent variable(s) having any defined percentile of the conditional distribution.

Dependent variable: Measures of Tax Avoidance

Following Dyreng et al. (2008), tax avoidance comprises all those actions, which trim down taxes of firm related to its pretax income. However, Dyreng et al. (2008) model has limitation for its applicability on data of a single country. This limitation was addressed by the model of Atwood et al. (2010) which is applicable for data of multiple countries and numerous firms. Hence, Atwood et al. (2010) model has been followed in this study. This model objectively predicts the likelihood of firm involving in activities of tax sheltering. With this model, researchers can estimate tax sheltering probabilities by employing publically available financial and accounting information/data. Wilson's (2009) empirical model is followed to estimate of each firm's probability of tax sheltering on a yearly basis. Although it is not easy to identify tax sheltering of a firm, however Wilson (2009) developed a model, by using a sample of firms which were availing tax sheltering. The purpose of this model is to give an educational guess about the likelihood of any firm regarding Tax sheltering. It is reproduced as follow:

$$SHELTERS_{it} = -4.86 + 5.20 \times BTD_{it} + 4.08 \times DAP_{it} - 1.41 \times LEV_{it} + 0.76 \times AT_{it} + 3.51 \times ROA + 1.72 \times FOREIGN\ INCOME + 2.43 \times R \ \& \ D$$

The current study uses cash effective tax rate (CETR) as an alternative dependent variable. It will help to comprehend and validate the findings and generalize those findings over the varying shapes/level of tax aggressiveness on tax avoidance continuum. Cash effective tax rate is recognized as a less hostile type of tax avoidance which computes the results of extensive tax avoidance activities.

Following Kim, Li and Zhang (2011), the three-year-centered moving sum of cash paid for income taxes over three years scaled by the moving sum of pretax income (net of special items) over the same period;

$$CASHETR = \frac{\sum_{t=1}^N CashTaxPai_{it} d_{it}}{\sum_{t=1}^N (Pr etaxIncome_{it} - Speciallts_{it} ms_{it})}$$

Independent Variables: Governance Bundles Measures

Following the prime aim of this study to investigate the effect of corporate governance bundles on tax avoidance, the core research design occupies measures of corporate governance bundles. Though the governance structure of a firm intricately involves compound contracts, associations, and unique features of firms, our focus is on governance mechanisms which intimately affect strongly on structures of corporate governance. Therefore, two different measures of the Company's governance are used. Following Pathan (2009) for strong corporate governance structure, this study uses proxy with the proportion of Independent directors (*BIND*) of the firm in the governing board. This study uses a dummy variable which equals to 1, if Chief executive Officer is also chair of governing board (*CEO-DUA*) to proxy for weak/poor corporate governance structure. Bhagat and Bolton (2008) apply the same calculation for CEO duality. Women on the governing board also play a significant role in governance. For the percentage of women on Board, this study uses (*WBoard*) variable for calculations as used by Baez et al. (2018).

Control Variables: Firm and Board Level Characteristics

This study is using control variables for many firm-related characteristics. These control variables have been exposed in literature, related to finance and accounting, as affecting tax avoidance at the firm level (Chen et al., 2010; Francis et al., 2014). Their work includes ROA (return on asset) in year t (total income divided by total assets), the value of (PPE) plant, property and equipment during the year t is calculated as gross property, plant and equipment scaled by lagged total assets. This measure of property, plant and equipment is used by Lyandres et al. (2008) and Wu et al. (2010). The reason behind controlling these variables is that they are related to both dependent and independent variables and can change the relationship of corporate governance and tax management. For example, controlling return on asset is important as the firms having high ROA will depicts different impact of corporate governance on tax avoidance as compare to the firms having low ROA. Other control variables include intangible assets (*INTANG*), cash holding, GDP, financial development and firm size (*SIZE*). Large and small companies enjoy different conditions so their response towards tax payment is also different. Most of the times small companies have to pay all of the taxes but large firms can exempt themselves for tax payment by using different tactics. Therefore, it is important to control firm size to examine the actual impact of corporate governance on corporate tax avoidance. Other variables were also controlled because of the similar reasons. In this study, intangible (*INTANG*) assets of the firm during a year t is measured as the ratio of total intangible assets scaled by lagged total assets by following Karampinis and Hevas (2014). This study follows Pinkowitz et al. (2006) for Cash holding which is measured as cash plus cash equivalents divided by total assets less cash and cash equivalents. Firm size (*SIZE*) during year t is calculated by taking the natural logarithm of the firm's total assets as used by Hunjra et al. (2014) and Mehmood et al. (2019). Gross Domestic Product is GDP is calculated as the natural log of GDP. This study also applied the World Governance Index as the dependent variable used by Gonzalez and Garcia-Meca (2014). This study uses corruption index to measurement investor protection. The index is available on International Country Risk Guide and this index is used by Pinkowitz et al. (2006). Financial development is also taken as a control variable which is measured as domestic credits to the private sector of the country as a proportion of GDP. Bayar and Ozturk (2016) used this measure

of financial development.

Table 1- Descriptions of variables

Variable Name	Symbols	Definitions	Reference(s)
Tax Sheltering	DUMSHLTR	=a dummy variable which equals 1 if a firm's estimated sheltering probability (according to Wilson, 2009) belongs to the top quartile in that year, and 0 otherwise.	Atwood et al. (2010)
Long term Cash ETR	CETR	= the three-year-centred moving sum of cash paid for income taxes over three years scaled by the moving sum of pre-tax income (net of special items) over the same period.	Kim et al. (2011)
Board Size	BS	= the number of directors on the firm board at the end of the financial year.	Bhagat and Bolton (2008)
Board Independence	INDP	= the proportion of board directors without any material or pecuniary relationship with the company, except the board seat.	Pathan (2009)
CEO Duality	CEO_DUA	=a dummy variable coded as 1 if the CEO of a firm serves as the chair of the BOD and 0 otherwise.	Bhagat and Bolton (2008)
Women On Board	WB	=Number of Women Directors in firm board	Baez et al. (2018)
Firm size	SIZE	=log of the total book value of assets as reported in the financial reports	Hunjra et al. (2014) and Mehmood et al. (2019)
Returns on Assets	ROA	= net income divided by total assets expressed as a percentage.	Afza et al. (2008) and Mehmood et al. (2019)
Plant, Property & Equipment	PPE	=gross property, plant & equipment scaled by lagged total assets.	Lyandres et al. (2008) and Wu et al. (2010)
Cash Holdings	CH	=(Cash + Cash Equivalents) / Total Assets (less cash and cash equivalents)	Pinkowitz et al. (2006)
Financial Development	FinDvt	Domestic credit to GDP	Bayar and Ozturk (2016)
Gross Domestic Product	GDP	Natural log of Gross Domestic Product	Amiram et al. (2018)
Intangible Assets	INTANG	= the ratio of total intangible assets scaled by lagged total assets.	Karampinis and Hevas (2014)
Investor Protection	Inv.Prot.	corruption index	Pinkowitz et al. (2006)
World Governance	WGI	World Governance Index	Gonzalez and Garcia-Meca (2014)

Note: This table describes the construction of the variables to be used in the proposed study.

Empirical Method and Model

For testing hypotheses of this study, the following generic model is used which links the proposed measures of corporate tax avoidance to measures of corporate governance and firm-level control variables.

$$y_{i,t} = a + \beta X_{i,t} + \theta D_{i,t} + \gamma Z_{i,t} + \eta_{i,t} + \varepsilon_{i,t}$$

In this equation, i denotes individual firms, t to a period. The $y_{i,t}$ represents measure for corporate tax avoidance, which is either DUM shelter or CETR. $x_{i,t}$ is being used here to represent variable of interest, board independence (BINDP), CEO duality (CDUA) and Women Representation in Board (WBOARD). $z_{i,t}$ is representing board level and firm-level control variables for controlling year and industry fixed effects, two variables are used. For controlling macroeconomic changes in operating environment of firm Year, FEs is used. The purpose of using Industry FEs is to avoid any result driven by differences in the characteristics of the industry. To control for industrial differences in proposed model, industry dummies are included, created from 48 Fama and French (1997) industry classifications. The process of analysis starts with measuring the individual effect of corporate governance (both weak and strong) on corporate tax avoidance via univariate analysis. Then as the second stage of analysis, the focus is on examining the corporate governance bundling effects. For the purpose, logistic regression and OLS regressions with firm effects control and year fixed effects control while having DUMSHLTR and CETR as dependent variables. The results are examined by using compliments or substitutes assessment model of the field of economics.

RESULTS

Table 2- Descriptive statistics

Variable	N	Mean	SD	Min.	Median	Max.	Skew.	Kurt.
Panel A: Dependent Variable								
GAAP ETR	47,105	0.213	0.177	0.000	0.204	1.000	2.004	9.610
TAXAVD	28,662	28.420	28.097	9.580	12.550	217.654	3.690	22.580
Panel B: Governance Variables								
BS	26,889	10.349	3.718	1.000	10.000	44.000	1.340	7.160
BINDP	25,251	50.195	30.295	7.156	53.320	95.280	-0.180	1.600
WOB	26,905	11.667	11.562	0.000	10.000	85.710	0.900	3.540
CEO_D	26,993	0.604	0.505	0.000	0.780	11.000	-0.730	2.350
Panel C: Control Variables								
PPE	48,289	4.588	236.106	0.000	0.416	25699.500	76.930	6404.000
INTNG	51,589	13.805	2959.841	-0.007	0.057	671853.400	226.700	51457.500
SIZE	55,275	8.945	2.919	-6.908	10.600	20.629	1.100	4.690
ROA	55,236	0.051	0.135	-0.931	0.052	0.467	-2.080	14.050
CH	54,732	0.112	0.137	-0.133	0.067	1.000	2.740	12.950
Fin_dvt	56,080	-0.047	0.806	-15.045	-0.170	9.229	2.230	110.480
GDP	56,080	23.561	1.772	19.782	22.630	29.456	0.490	0.817
Inv. Prot.	56,190	2.699	2.617	0.000	4.000	7.700	0.116	1.360
WGI	56,214	65.364	35.079	0.948	90.910	100.000	-0.539	1.543

Note: GAAP ETR = Cash Effective Tax Rate, TAXAVD = Tax avoidance, BS = Board Size, BINDP = Proportion of Independent Directors, WOB = Women members on board, CEO_D = CEO Duality, PPE = Property, Plant and Equipment, INTNG = Asset Intangibility, SIZE = Natural log of Total Assets, ROA = Return on Assets, CH = Cash Holdings, Findvt = financial development, GDP = Gross Domestic Product, Inv. Prot. = Investor Protection, WGI = World Governance Index

Table 2 explains the description of values. The average values of cash effective tax rate and tax avoidance indicate that firms in developed and developing countries are more keen towards paying tax and they are following rules of paying tax. Variation in the values of cash effective tax rate is not very high. However, the maximum value of cash effective tax rate suggests that there are firms which face a very high amount of tax on their earnings. Whereas, Panel B for governance variables shows that the average board size of the firms in overall selected countries is around ten members. Besides, developed countries take services of more number of board members to handle the management operations. Therefore, deviation in the values of board size is high due to a great difference between the minimum and the maximum number of board members. Further, outputs show that half of the board members are independent board members.

For women representation, it shows that among those ten board members, 11% are women board directors. It depicts that women on the board are still not getting dominance and they represent a very small portion of the board in the firms. Results also suggest that most of the CEOs also act as chairman of the board. Panel C depicts the values for control variables. The average return on equity not very high with a small deviation in the value. However, the average return on equity is higher than the return on assets. Results indicate that firm in developed and developing countries. Further, most of the financing is spent on fixed assets, including intangible assets. Fixed assets investment includes plant, property and equipment. Table 4 represents the correlation among the independent variables of this study. Findings of the correlation matrix reveal the highest value as 0.688 which is between investor's protection and GDP followed by -0.625 followed by world-wide governance indicator and investor's protection. Hence, overall findings indicate that there is not a high value of the correlation between variables which means that there is no problem of multicollinearity. Table 3 represents the results of regression models which represents GAAP ETR. Here this study examines the effect of variables of corporate governance on tax avoidance at corporate level (Model 1) directly. In model 3, to model 7, the existence of complimentary and substitutive relationship among various mechanisms is tested.

Table 3- Estimates of corporate governance on tax avoidance

	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5	(6) Model 6	(7) Model 7
PPE	0.015 (0.037)	0.011 (0.034)	0.015 (0.036)	0.0139 (0.037)	0.010 (0.037)	0.012 (0.037)	0.015 (0.037)
INTANG	-0.323 (0.204)	-0.315 (0.200)	-0.322 (0.203)	-0.320 (0.203)	-0.308 (0.202)	-0.313 (0.205)	-0.324 (0.204)
SIZE	-0.289* (0.139)	-0.138 (0.149)	-0.285* (0.139)	-0.289* (0.139)	-0.365** (0.140)	-0.285* (0.139)	-0.289* (0.139)
ROA	-1.048 (1.829)	-0.518 (1.786)	-1.018 (1.831)	-1.114 (1.841)	-1.367 (1.838)	-0.830 (1.835)	-1.036 (1.834)
CH	6.903*** (1.978)	6.534** (2.004)	6.971*** (1.981)	6.821*** (1.989)	6.991*** (1.988)	6.664*** (1.976)	6.899*** (1.978)
Fin_ dvt	3.222*** (0.504)	3.194*** (0.500)	3.221*** (0.503)	3.226*** (0.503)	3.219*** (0.500)	3.223*** (0.503)	3.220*** (0.504)
GDP	-3.090*** (0.283)	- 3.048*** (0.285)	-3.070*** (0.281)	-3.073*** (0.288)	-3.118*** (0.283)	-3.100*** (0.284)	-3.093*** (0.283)
Inv.Prot	3.656*** (0.191)	3.581*** (0.212)	3.640*** (0.188)	3.655*** (0.192)	3.696*** (0.193)	3.638*** (0.185)	3.658*** (0.191)
WGI	-0.426*** (0.014)	- 0.427*** (0.014)	-0.426*** (0.014)	-0.427*** (0.014)	-0.423*** (0.014)	-0.427*** (0.014)	-0.426*** (0.014)

BS	0.573** (0.187)	1.227* (0.477)	0.683*** (0.189)	0.429*** (0.109)	0.566** (0.187)	0.577** (0.185)	0.571** (0.187)
BINDP	-0.044*** (0.012)	0.115+ (0.069)	-0.044*** (0.012)	-0.043*** (0.011)	-0.098*** (0.014)	-0.064*** (0.013)	-0.044*** (0.012)
WOB	-0.053** (0.019)	-0.044* (0.020)	0.0320 (0.070)	-0.051** (0.019)	-0.272*** (0.051)	-0.052** (0.019)	-0.046* (0.021)
CEO_D	-0.239 (0.417)	-0.375 (0.402)	-0.256 (0.420)	-2.676 (2.774)	-0.156 (0.414)	-2.209 (1.520)	-0.069 (0.711)
BSBINDP		-0.016* (0.007)					
BSWOB			-0.009 (0.007)				
BSCEO_D				0.240 (0.287)			
BINDPWOB					0.004*** (0.001)		
BINDPCEO_D						0.032 (0.020)	
WOBCEO_D							-0.011 (0.030)
Constant	122.2*** (6.625)	113.4*** (8.422)	120.7*** (6.576)	123.3*** (6.386)	125.9*** (6.832)	123.8*** (6.951)	122.2*** (6.627)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.384	0.386	0.384	0.384	0.385	0.384	0.384
F Wald	527.7	513.2	505.8	507.6	508.9	510.1	504.9
Observations	12832	12832	12832	12832	12832	12832	12832

Note: GAAP ETR = Cash Effective Tax Rate, TAXAVD = Tax avoidance, BS = Board Size, BINDP = Proportion of Independent Directors, WOB = Women members on board, CEO_D = CEO Duality, PPE = Property, Plant and Equipment, INTNG = Asset Intangibility, SIZE = Natural log of Total Assets, ROA = Return on Assets, CH = Cash Holdings, Findvt = Financial Development, GDP = Gross Domestic Product, Inv. Prot = investors protection , WGI = World Governance Index

In Model 1, board size is significantly related to tax avoidance, where the p-value is less than 0.05, showing confidence level at 95%. As bs (board size) is inversely related to tax avoidance. It means bigger the size of the firm is; lesser is the tax avoidance by the firm. Further, the negative impact of board size on tax avoidance signifies that increase in the number of members on the board leads to encouraging in decreasing effective tax rates of the firms. Board independence has an inverse relationship with GAAP ETR which shows that more board independence tends to less tax avoidance by firms. The third mechanism of corporate governance in this study is WOB (women on board) representing diversity in the board of companies. It also shows a significant and negative effect on corporate tax avoidance. It shows more contribution of women towards decreasing tax avoidance. Results of corporate governance are similar to the outputs of Khaoula and Ali (2012). CEO duality is the fourth independent variable which demonstrates that the CEO duality is highly significantly related to tax avoidance. Keeping in mind the inverse relationship, this study finds that higher the CEO duality, higher the chances of tax avoidance of the companies. The findings of the study also justify the increasing contribution of CEO where he has completed inside information relating to key matters of the firms. This result follows the point that assigned tasks to external directors to depend on the nature of instructions that the CEO provide to them (Song and Thakor, 2006). In this way, external directors can also have more monitoring capabilities and they also help firms to reduce effective tax rates. In table 4, the results of correlation are reported to check the multicollinearity among the variables. It is found that there is no serial correlation among the variables. Therefore, all the variables can be processed together.

Table 4- Correlation analysis

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.GAAP ETR	1.000													
2.TAX AVD	-	1.000												
3.BS	0.055 ***	-	1.000											
4.BIN DP	-	-	-	1.000										
5.WOB	0.015 *	0.352 ***	0.136 ***	-	1.000									
6.CEO_D	-	0.001	0.027 ***	0.287 ***	-	1.000								
7.PPE	0.024 ***	0.007	-	-	-	1.000								
8.CEO_D	0.050 ***	0.007	-	-	-	1.000								
9.INTNG	0.001	-	-	-	-	0.010	1.000							
10.SIZE	0.001	0.001	0.002	0.007	0.002	0.002	0	1.000						
11.ROA	0.041 ***	-	0.004	0.007	-	-	0.006	0.009	0.07	1.000				
12.CH	0.0347 ***	0.003	0.347 ***	-	-	-	0.04	0.04	-	-	1.000			
13.Fin_dvt	0.041 ***	0.003	0.347 ***	0.273 ***	0.184 ***	0.045 ***	0.04	0.04	0.0	0.01	0.122 ***	1.000		
14.GDP	0.064 ***	-	-	0.009	0.051 ***	-	0.00	-	-	0.122 ***	1.000			
15.InvProt	0.036 ***	0.001	0.167 ***	0.054 ***	0.069 ***	0.010 +	0.00	0.0	0.0	-	-	1.000		
16.GDP	-	-	-	-	-	-	0.00	0.0	0.0	-	-	1.000		
17.InvProt	0.013 **	0.121 ***	0.106 ***	-	-	0.036 ***	-	0.0	0.039 ***	0.015 ***	-	0.032 ***	1.000	
18.GDP	-	-	-	-	-	0.145 ***	0.01	0.0	0.261 ***	0.026 ***	0.010 *	-	0.189 ***	1.000
19.InvProt	0.012 **	0.008	0.090 ***	0.303 ***	0.159 ***	0.145 ***	0.01	0.0	0.261 ***	0.026 ***	0.010 *	-	0.189 ***	1.000
20.InvProt	-	0.004	-	-	-	0.306 ***	-	0.0	0.294 ***	0.055 ***	-	0.105 ***	0.68 8***	1.000
21.InvProt	0.046 ***	0.026 ***	0.513 ***	0.159 ***	0.159 ***	0.306 ***	0.00	0.06	0.294 ***	0.055 ***	-	0.105 ***	0.68 8***	1.000

Note: GAAP ETR = Cash Effective Tax Rate, TAXAVD = Tax avoidance, BS = Board Size, BINDP = Proportion of Independent Directors, WOB = Women members on board, CEO_D = CEO Duality, PPE = Property, Plant and Equipment, INTNG = Asset Intangibility, SIZE = Natural log of Total Assets, ROA = Return on Assets, CH = Cash Holdings, Findvt. = Financial development, GDP = Gross Domestic Product, InvProt = investor protection, WGI = World Governance Index, +p<0.10, *p<0.05, **p<0.01, ***p<0.001

DISCUSSION

The above discussion answers our research question. It finds that corporate governance has impacted over corporate tax avoidance. However, the magnitude of all mechanisms (individually) is not the same. The nature of effect is also not the same over corporate tax avoidance. The combined effect of mechanisms of corporate governance on corporate tax avoidance is represented inside model 2 to model 7. They are looking at the values in model 2 which examines for complimentary and substitutive effects. For having marginal effects of two mechanisms of corporate governance (CG) bundles that function with values of coefficients. For this, both of the values i.e. the individual coefficient value of governance mechanisms and interaction coefficients are analyzed for exploring the effects of corporate governance bundles. The results in model 2(2) show that the interaction between board size and independent board members is not significant. It also shows that they have a neutralizing effect on each other. From results, it is found that larger size of the board and a large number of independent board members are having a substitutive effect to each other while impacting over a decision on corporate tax avoidance. Chen et al. (2010) explain that good implementation of corporate governance practices decreases the cost of

monitory the operations with the help of higher transparency and control in the firms.

The results of model 3(3) reveal that interaction between two mechanisms, i.e., board size and women on board is negatively significant. As per results, the increased number of board members having a larger number of women in board tends to increase tax avoidance. By seeing the values of women on board and board size individually, it is found that the effect of diversity on tax avoidance is insignificant, whereas board size is significantly related to the decision of tax avoidance. However, they complement each other when they interact and work together that is why the companies with higher diversity and large board size tend towards the lower side of tax payment. The results of model 4(4) indicate that interaction between board size and CEO duality is insignificant over the decision of tax avoidance. The increased number of board members having CEO duality inboard does not cause an increase in tax avoidance. By seeing the values of board size and CEO duality individually, the increase in board size does not tend toward tax avoidance, whereas the presence of CEO duality in firms tends towards enhanced tax avoidance. Interestingly when they interact with each other, they give the substitutive effect of each other on the decision of corporate tax avoidance. That is why the companies with large board size and higher CEO duality tend towards the lower side of tax avoidance and these results are supported by Randoya and Goel (2003) and Oh et al. (2016).

The results from model 5(5) depict that interaction between increased independent board members and the increased number of women in a board is highly significant over tax avoidance decision. The increased board size with larger board diversity does not cause the decision of enhanced tax avoidance. The individual value of increased board size also does not tend towards more tax avoidance, whereas the presence of an increased number of women on board effects on increased tax avoidance. When both mechanisms interact with each other, they produce a substitutive effect on the decision of tax avoidance which are aligned with the study of Chen and Chu (2005). The model 7(6) shows the interaction between independent board members and CED duality over tax avoidance is insignificant. These two mechanisms collectively do not cause enhanced tax avoidance. The individual value of CEO duality mechanism shows that it causes enhanced tax avoidance. The individual value of impendent board members also shows impact over enhanced tax avoidance. But when both mechanisms interact with each other, they are producing substituting/complimenting effect which are confirmed by Hoskisson et al. (2009) and Schepker et al. (2018).

CONCLUSION

The present study examines the impact of corporate governance bundles on tax avoidance in developed and developing countries. The study consists of a sample period of 17 years from 2002 to 2018. Results signify that the governance system is contributing toward decreasing the effective tax rate by implementing effective taxation policies. The study emphasizes on how governance is related to a decrease in effective tax rates of the firms. Although corporate governance is contributing towards reducing effective tax rate at the same time, the board of directors should make such tax policies which do not follow illegal avoidance of tax. Results suggest that women are not much dominant in the board of the firms. However, firms should give power to women to involve in the matters of the board because they are also contributing to decreasing effective tax rates. The results of the current study provide insight to the firms that by implementing effective governance system, and effective control of planning regarding taxation can result in benefits of reducing the effective tax rate. The application of corporate governance in developed and developing countries has also got much attention because of the valuable contribution of governance system towards firms' outputs and taxation system. Although, corporate governance system is considered to key part in monitoring and executing different operations in the

firms and it has dynamic vision worldwide, still the question of performance of corporate governance in developing countries has got much debates. Developing countries need to monitor the effective implementation of corporate governance in the firms. The findings of the current study have policy implications for the firms in developed and developing countries. Although the governance system is contributing towards decreasing avoidance of tax, but the negative impact of board size on tax avoidance suggests that members on board should pay attention towards tax policies in order to reduce tax effective rates. This issues mainly refers to the developing countries due to agency issues prevailing in the companies. However, in developed countries like US, companies hire people on the board particularly for serving the firms (Klein, 1998). They serve the firms with responsibilities which is the reason that they provide benefits to the firms by decreasing effective tax rates in developed countries.

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Appendix 1- Industry and Countries in this Research for the period of 2002-2018

Proposed Industry for the research	Proposed Countries for the research
Automobiles & Components	Australia
Capital Goods	Bangladesh
Commercial & Professional Services	Belgium
Consumer Durables & Apparel	Canada
Consumer Services	China
Diversified Financials	Finland
Energy	France

Food & Staples Retailing
Food, Beverage & Tobacco
Health Care Equipment & Services
Household & Personal Products
Insurance
Materials
Media
Pharmaceuticals, Biotechnology & Life
Real Estate
Retailing
Semiconductors & Semiconductors Equipment
Software & Services
Technology Hardware & Equipment
Telecommunication Services
Transportation
Utilities

Germany
Hong Kong
India
Ireland
Italy
Japan
Luxembourg
Mexico
Netherlands
New Zealand
Pakistan
Papua New Guinea
Russia
Singapore
South Africa
Spain
Sweden
Switzerland
UK
USA
