The Impact of Information Asymmetry on the Relationship Between Board Characteristics and Capital Structure

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This paper explores the role of information asymmetry in the association between board characteristics and capital structure using OLS & GMM for 96 firms listed on the Egyptian stock exchange with 672 firm-observation through the period 2014–2020 via the Thomson Reuters database. Results show that a large board size enhances strict control and forces increased debts to maximize firm value and higher board independence leads to the tendency to use less financial leverage to avoid raising risks. CEO duality leads to the use of small amounts of debt to avoid pressures and risks. Results show that Firms with high information asymmetry prefer high leverage. Finally, results clarified that board characteristics hurt capital structure in the case of countries that suffer from information asymmetry like Egypt.

Keywords: board characteristics, board size, board independence, CEO duality, information asymmetry, capital structure

INTRODUCTION

Theories of capital structure (CS) found that static trade-off static differentiation contradicts the thought of Modigliani and Miller (1963), which assumes the stability of bankruptcy and agency costs, but in the case of tax shield expect increased market value with raise in the proportion of borrowed funds, while the theory of static trade-off requires the existence of an optimal level of borrowing at which the market value reaches its maximum and after which the market value decreases (Miller, 1977).

Stieglitz (1973) shows the dynamic trade-off theory by examining the effects of taxation from the perspective of public finance, but this theory isn't an equilibrium theory because it assumes the uncertainty principle. The theoretical argument shows the role of dynamic trade-off theory by looking at the balance between tax shields versus the cost of bankruptcy. This paper analyzed continuous-time models with uncertainty, taxes, and bankruptcy costs, but without transaction costs.

Firms respond immediately to adverse shocks by rebalancing at no cost, so companies maintain high levels of debt to take advantage of the tax shields (Kane et al., 1984 & Brennan Schwartz, 1984). Pecking order theory refers to firms having a mix between equity and debt, which decreases their cost of capital. This theory assumes that there is an information asymmetry between managers and external investors, so it is preferable to rely on internal financing through retained earnings since it reduces the degree of risk and increases the volume of self-financing, and increases the chances of obtaining new loans and then relying

on debt as a low-cost source of financing, which is a positive sign and then resorts to issuing new shares as a last resort to avoid wrong pricing of shares resulting of information asymmetry (Ross,1977).

Baker and Wurgler (2002) present the latest model of capital structure. The idea of this model is based on the impact of market conditions on the capital structure so, there is an increase in the cost of borrowing and an expected increase in the bankruptcy risk associated with debt financing. The solution will lie in the first orientation of equity and then debt, while if the cost of borrowing and bankruptcy risks associated with debt financing is low, it is necessary to go into debt financing whenever possible.

LITERATURE REVIEW

Agency theory occurs in companies as a result of the separation between owners and agents and emphasizes the reduction of this problem where the owners delegate the authority to the managers to manage their firms on their behalf and then the agency conflict is established between principal and agents, where both parties work for their self-interest, which led to the emergence of the agency problem. One of the most important internal governance practices that reduce agency conflict between managers and owners is board characteristics (BCH) (Adams & Ferreira, 2009).

Jensen and Meckling (1976) point out that there is a contractual relationship between owners and agents, from incentive structure, labor market, and information asymmetry play a critical role in agency problems, in which shareholders increase their wealth by entering into profitable and risky projects as for the managers if they do not own shares in the firm, they will not have an interest in achieving the efficiency as to the creditors resisting the integrity of the financial position in the firm.

Heng el at. (2012) argued that board characteristics are one of the internal mechanisms of organizational, effective, and controlling internal governance, which can contribute to reducing the arising agency problem. Board Size (BS) consists of several directors who are nominated by the company's shareholders to supervise and manage their firms, and therefore the existence of a board size within the company is one of the important factors that help to achieve strong performance, and thus increase firm value. Board effectiveness depends on board composition, the presence of a large percentage of non-executive directors within the board may make it more effective in controlling the work of the administration, and it is possible to reduce the freedom of administrative action as well as separation or non-separation of roles between CEO and Chairman of the board has a significant impact on board independence which, it may lead to better performance and reduction in agency problems (Florackis, 2008).

This study explores the role of board characteristics in reducing the agency problem and influencing capital structure decisions. This study divided the board characteristic into four mechanisms including board size (BS), board independence (BI), and CEO duality (DU). The following formulation of the first hypothesis is made in light of these empirical justifications:

H_1: *BCH has a positive impact on CS.*

Board Size and Capital Structure

Board Size (BS) plays a key role in the success of the company, as it is responsible for taking strategic decisions, blaming them, and working to achieve a growth rate and increase wealth. Firms tend to be a large board size to get more effective control of the company's activities and provide the best expertise and skills. On the contrary, a large board size may be less effective in the case of board members relying on others working on the business performance (Sheik and Wang, 2012).

Some studies have found the existence of a positive relationship between board size and capital structure (Abor, 2007; Gill et al., 2012; Heng et al., 2011), results support increasing board size providing strict control over the management, and forcing it to increase debts to maximize firm value, especially in the case of increase non-executive directors.

However, other studies have discovered a reverse association between board size and capital structure (Hassan and Butt, 2009), in which large boards push managers to reduce financial debt to reduce bankruptcy

risk, especially in large firms that depend more on internal financing. According to these explanations, the first sub-hypothesis formulated as follows:

H_{1a}: *BS has a positive impact on CS.*

Board Independence and Capital Structure

Board Independence (BI) is one of the internal governance mechanisms, which refers to the proportion of non-executive directors within the board. This is a signal to the market that the firm is being monitored, more efficient, and effective thus, perceived by the lender as good from a standpoint of credit, which facilitates the company to obtain the financing required for the performance of its business.

Some studies argued that there is a positive association between board independence and capital structure (Sheikh and Wang, 2012 & Abor, 2007), these studies refer to agency theory indicating that the presence of a high percentage of non-executive directors inside the board means that these directors do not have any executive positions within the company and thus increase supervisory performance and this helps in reducing the conflict between shareholders and managers within the company. BI contributes to enhancing financial leverage.

On the contrary, other studies have found a reverse association between BI and CS. Theoretical perspectives support the view that increasing non-executive directors' ratios and raising the control tend to use less financial leverage to avoid raising risks from using high amounts of debt. Firms endowed with strong corporate governance have a high level of achievement and less financial leverage such as strict regulations, the presence of a small number of managers, a large number of external directors within the board, and the CEO obtaining appropriate salaries and bonuses that force managers to use low amounts of debt (Wen et al., 2002).

Boubakari & Feudjo (2020) emphasized that board composition plays a vertical role in the selection of capital structure in family firms, although the objectives of managers and shareholders are the same in family firms. Thus, there is no conflict of interest between managers and shareholders. Family firms should view corporate governance as an opportunity and not as an obligation. Family firms can help avoid mismanagement and support the stability within firms without exposure to bankruptcy risk. Managers and stakeholders alike must understand that the firm's ability to expand its current operations and enter new markets is essential to its existence.

Usually, family firms seek to avoid financial leverage, except increasing the non-executive's ratio leads to increase debt when it becomes necessary in the interest of the state. The pecking order theory (POT) is supported by the financing practices of family businesses, which first employ internal money, then incur debt, and ultimately issue new shares. The following is the second sub-hypothesis formulated:

H_{1b}: *BI has a negative impact on CS.*

CEO Duality and Capital Structure

Fosberg (2004) argued that the leadership structure can help directors employ the right amount of debt in the capital structure and minimize agency issues. Leadership Structure or CEO duality (DU) is a control mechanism that means not one person is subject to an exercise both CEO and the chairman. Fama & Jensen (1983) suggest that a key factor in determining board efficiency is the separation of the CEO and chairman's responsibilities.

According to Gill et al (2012), there is a favorable correlation between CEO duality and capital structure in small businesses in India, where a small business represents nearly 95% of the total industrial sector addition these firms usually tend to finance through debt, so the decision to finance through debt financing in meeting business in the case of lack of internal financial resources or called equity financing.

Modigliani and Miller (1958) began studying the theory of capital structure, most researchers have become interested in studying these theories, but there are a few studies that have been interested in studying the association between corporate governance and capital structure, especially in small firms. Some studies argued that there is a positive association between DU and CS (Gill et al., 2012 & Abor, 2007).

Empirical studies refer to there is a positive association between DU and CS. The dual role of the Chairman and CEO leads to increase debts. At the same time, firms with good separation between the duties of the chairman and CEO because there is a higher degree of governance and lower agency problems using small amounts of debt. Results indicate that when the CEO is the same as the chairman of the board of directors, which leads to the employment of high amounts of debt. This result supports an agency theory. Other studies indicated that there is a negative relationship between DU and CS (Sheikh and Wang, 2012 & Mubeen et al., 2020), in which the CEO is in charge of managing the company, and the chairman is in charge of managing the board business.

DU increases the CEO's authority through his influence and control. According to agency theory, separating management from the control of the decision is vital to reduce the conflict between stakeholders and managers. The dual role of the CEO helps in doing business more effectively through the CEO executive leading to higher performance. This result refers to if the CEO is the same as the chairman, DU leads to the use of small amounts of debt to avoid the pressures and risks resulting from the employment of high financial leverage. This result supports a resource dependency theory. The following is the third sub-hypothesis formulated:

H_{1c}: *DU has a negative impact on CS.*

Information Asymmetry and Capital Structure

Myers and Majluf (1984) pointed out the importance of information asymmetry (IA) in enhancing financial decision-making. Some studies support POT, in which debt structure is less information sensitive to the opposite option problems compared to equity capital. If companies offer external finance, they typically favor debt over stock (Fama and French, 2002).

Other studies argue that POT has not succeeded under specific circumstances (Leary and Roberts, 2010). Firms tend to set limits for risky debt before proceeding with the preference for equity financing which becomes costly. Numerous studies back up the claim that IA and CS are negatively correlated in the U.S., in which higher information asymmetry may create lower financial leverage and vice versa (Stohs and Mauer,1996; Berger et al., 2005: Fosu et al.,2016).

Other studies stated the positive association between IA and CS. Firms having higher IA prefer higher financial leverage and vice versa (Gao and Zhu, 2015; Andres et al.,2014; Danso et al.,2019; Aflatooni and Khazaei, 2020) in developed countries. This study explores the role of POT by investigating the association between IA and CS decisions. Based on these empirical explanations, the second and third hypotheses are formulated as follows:

H_2: *IA has a positive impact on CS.*

H_3: *IA has a significant impact on the relationship between BCH and CS.*

METHODOLOGY

This study uses 96 companies listed on the Egyptian market with 672 observations except for financial sectors that exclude in this sample through the period 2014–2020 collected via the Thomson Reuters database. This study chooses this period because of political and economic stability in emerging markets like Egypt (Rashed, et al., 2018; Mohamed & Rashed, 2021; Shehata and Rashed, 2021; Rashed and Ghoniem, 2022).

TABLE 1
SAMPLE SELECTION BY SECTORS

Sector	Freq.	Percent
Basic resources	49	7.29
Chemicals	49	7.29
Construction and materials	105	15.63
Food and Beverage	126	18.75
Healthcare and Pharmaceuticals	14	2.08
Oil and Gas	14	2.08
Personal and Household products	42	6.25
Real estate	126	18.75
Retail	14	2.08
Technology	7	1.04
Telecommunication	21	3.13
Travel and Leisure	49	7.29
Industrial goods and services	56	8.33
Total	672	100.00

This table shows that three sectors included in the sample which possess real estate, food, beverages, construction, and materials sectors at 53.1% for all sectors in the sample, then come industrial goods and services, basic resources, chemicals, travel, and leisure; personal and household products at 36.5% of the total sample, then finally come in the last sectors in the sample each of telecommunication, healthcare & pharmaceuticals, oil & gas, retail and technology sectors at 10.4 % of the total sample. This study explores the impact of IA on the relationship between BCH and CS through the following equation:

$$\mathrm{DTA_{it}}\ \text{or}\ \mathrm{DTE_{it}} = \alpha + \beta_1 BCH_{\mathrm{it}} + \beta_2\,\mathrm{RVOL_{it}} + \beta_3 \mathrm{BCH_{it}} * \mathrm{RVOL_{it}} + \beta_4\,\mathrm{FS_{it}} + \beta_5 \mathrm{Tang_{it}} + \beta_6\,\mathrm{ROA_{it}} + \beta_7\,\mathrm{TQ_{it}} + \beta_8\,\mathrm{FA_{it}} + \beta_9\,\text{Industry fixed effect} + \beta_{10}\text{Year fixed effect} + \epsilon_{\mathrm{it}} \quad (1)$$

$$\mathrm{DTA_{it}}\ \text{or}\ \mathrm{DTE_{it}} = \alpha + \beta_1 BS_{\mathrm{it}} + \beta_2\,\mathrm{BI_{it}} + \beta_3 \mathrm{BDU_{it}} + \beta_4\,\mathrm{RVOL_{it}} + \beta_5 \mathrm{BS_{it}} * \mathrm{RVOL_{it}} + \beta_6\,\mathrm{BI_{it}} * \mathrm{RVOL_{it}} + \beta_7\,\mathrm{BDU_{it}} * \mathrm{RVOL_{it}} + \beta_8\,\mathrm{FS_{it}} + \beta_9 \mathrm{Tang_{it}} + \beta_{10}\,\mathrm{ROA_{it}} + \beta_{11}\,\mathrm{TQ_{it}} + \beta_{12}\,\mathrm{FA_{it}} + \beta_{13}\,\text{Industry fixed effect} + \beta_{14}\text{Year fixed effect} + \epsilon_{\mathrm{it}} \quad (2)$$

Most studies have measured capital structure via financial leverage measured as DTA & DTE. DTA is total debts to assets while DTE is total debts to total equity. Also, we measured board characteristics (BCH) by principal component analysis (PCA) for three indicators to get the board index.

BCH was measured by three indicators including BS, BI, and BDU to explore the impact of each indicator on capital structure (DTA or DTE). The natural logarithm of the board of directors is used to measure BS, while the percentage of independent directors on the board is used to calculate board independence, and a dummy variable is used to calculate CEO duality, which is calculated as 1 if the chairman and chief executive officer are the same person and 0 otherwise.

Share price volatility (return volatility) and firm share trading volume are used to calculate IA (reverse selection). According to control variables, the natural logarithm of total assets to calculate the firm size (FS), tangibility ratio (Tang) is determined by scaling fixed assets by total assets, return on assets (ROA) is determined by the ratio of net income to total assets, firm value (TQ) is determined by Tobin's Q, which is the ratio of the market value of assets to total assets and firm age (FA) is determined by the natural logarithm of the number of years since the firm was founded.

EMPIRICAL ANALYSIS

TABLE 2
DESCRIPTIVE ANALYSIS

Variables	Obs	Mean	STDV	Min	Max	p1	p99	Skew.	Kurt.
DTA	672	.468	.217	.084	.8	.13	.79	-.063	1.741
DTE	672	.472	.22	.13	.79	.13	.79	-.082	1.711
BS	672	.869	.119	.699	1.041	.699	1.041	-.098	1.819
BI	672	.704	.133	.47	.88	.47	.88	-.331	1.932
BDU	672	.643	.48	0	1	0	1	-.596	1.356
RVOL	672	.795	.106	.63	.96	.63	.96	.01	1.877
TV	672	.784	.112	.63	.96	.63	.96	.129	1.762
FS	672	5.906	.614	4.901	6.785	4.901	6.785	-.245	1.889
Tang	672	.459	.248	.07	.867	.087	.82	-.022	1.673
ROA	672	.055	.068	-.044	.173	-.044	.173	.308	1.998
TQ	672	.825	.694	.142	2.363	.142	2.363	1.153	3.14
FA	672	1.467	.219	1.114	1.785	1.114	1.785	-.057	1.764

Table (2) shows the descriptive variables with 672 observations via the Thomson Reuter database within the period 2014 to 2020. Table (2) shows an increase in financial leverage (DTA and DTE). Also, this table refers to increased board indicators (board size, board independence, and board duality. According to information asymmetry indicators that measured return volatility and trading volume found that increase information asymmetry (RVOL and TV). This table shows raising all control variables (FS, Tang, ROA, TQ, and FA). The normal distribution shows the skewness and Kurtosis value is between (+-3, +-10) respectively, which all variables are close to a normal distribution as well as the sample is higher than 30 firms. All variables are subject to a normal distribution according to the central tendency theory.

Table (3) shows that there is a positive association between BS and capital structure (DTA & DTE) while there is a negative relationship between both BI and DU with capital structure (DTA & DTE). Also, there is a positive association between IA (RVOL & TV) and CS. There is a positive association between both FS and FA with capital structure (DTA & DTE) while a negative association between ROA, tang, TQ, and capital structure (DTA & DTE).

TABLE 3
CORRELATIONS MATRIX

VAR	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) DTA	1.000											
(2) DTE	0.907*	1.000										
(3) BS	0.10*	0.09*	1.000									
(4) BI	-0.13*	-0.12*	-0.062	1.000								
(5) BDU	-0.09*	-0.13*	0.011	0.090*	1.000							
(6) RVOL	0.129*	0.08*	-0.007	0.056	-0.022	1.000						
(7) TV	0.130*	0.07*	-0.007	0.076*	-0.051	0.683*	1.000					
(8) FS	0.142*	0.16*	0.10*	-0.11*	-0.075	0.054	0.067	1.000				
(9) Tang	-0.12*	-0.08*	-0.11*	0.082*	-0.12*	0.014	0.078*	-0.037	1.000			
(10) ROA	-0.005	-0.03	0.13*	-0.16*	-0.032	-0.035	-0.028	0.366*	-0.14*	1.00		
(11) TQ	-0.12*	-0.15*	-0.020	-0.023	-0.13*	0.061	0.035	-0.10*	0.042	0.16*	1.00	
(12) FA	0.152*	0.13*	-0.07*	-0.016	0.079*	0.097*	0.023	0.015	-0.11*	0.04	0.013	1.00
*** *p<0.01*, ** *p<0.05*, * *p<0.1*												

PANEL TESTS

TABLE 4
COMPARISONS BETWEEN FIXED, RANDOM, AND POOLED EFFECT MODEL

Tests	Coef.
Hausman Test	
Chi-square test value	26.115
P-value	.002
Breusch and Pagan Test	
Chibar2(01)	349.94
Prob > chibar2	0.062

Table (4) displays the Hausman test, where the fixed effect model performs better than the random effect model due to the lower p-value (0.05). Additionally, the pooled effect model is considered by Breusch and Pagan's test to be superior to the random effect model because its p-value is larger (0.05) Consequently, the pooled effect model was used for all hypothesis testing in this investigation (OLS).

TABLE 5
DIAGNOSTICS TESTS

Heteroskedasticity	Chi2 (1) = 0.21	Prob > chi2 = 0.644
Omitted variable	F (3, 658) = 0.67	Prob > F = 0.570
Unit Root	T-statistic = -38.059	P-value = 0.000
Auto Correlation	Durbin-Watson Statistic (9, 672) = 2.010	
Cointegration	T- statistic= -2.294	Prob = 0.000

Table (5) shows that the Chi2 value is (0.21), which p-value is less than (0.05), and then lack of existence of a heteroscedasticity problem. Also, the F-test value is (0.67), which is less than (0.05) so this is no omitted problem. Unit Root refers to the T-test as (-38.059), which means that there is stationary series within the period between 2014-2020. Autocorrelation shows that the Durbin Watson value is (2.010), which means this is above 1.5 and there is no autocorrelation. Co-integration refers to the T-value (-2.294) whose p-value is less than 0.05 so, there is a long- equilibrium. All diagnostics tests show that OLS is the best to evaluate hypothesis tests.

OLS REGRESSION

TABLE 6
ORDINARY LEAST SQUARE (OLS) FOR LEVERAGE (DTA & DTE)

Variable	DTA	DTE
BCH	-.0242**	-.0328***
RVOL	.2438**	.1570*
BCH*RVOL	-.0345**	-.0326**
FS	.0439**	.0539***
ROA	-.2415	-.3356*
Tang	-.1067**	-.0795*
TQ	-.0310**	-.0457***
FA	.1368***	.1293***

Industry &Year FE	Yes	Yes
_Cons	-.0981	-.0674
N	672	672
R2	.1055	.1132
R2_a	.0947	.1025
AIC	-202.87	-190.78
BIC	-162.28	-150.19
RMSE	.2066	.2085

Table (6) indicates there is a negative impact of return volatility on the relationship between board characteristics and capital structure which is the coefficient value for two models (DTA & DTE) is (-0.0345 & -0.0326) respectively. This result supports the view that the existence of information asymmetry (raise return volatility) leads to a negative relationship between BCH and financial leverage (CS) so, the first hypothesis H_3 is accepted. Also, results refer to there is a negative impact of BCH on CS (-0.0242 & -0.0328) respectively. Also, this table above showed that increased BCH lead to decrease financial leverage so the first hypothesis H_1 is accepted while a positive impact of IA on CS (0.2438 & 0.1570) so, the second hypothesis H_2 is accepted.

According to control variables find both FS and FA have a positive impact on CS (0.0439-0.0539 & 0.01368- 0.1293) while a negative impact for both tangibility (Tang) and firm value (TQ) on capital structure (-0.1067-0.0795 & -0.0310-0.0457). This table shows that OLS is the best model and leverage indicators (DTA & DTE) are close to appropriate to measure leverage because all R^2, R^2 adjusted, AIC & BIC values are very close to results for two models that measured capital structure (DTA &DTE).

TABLE 7
OLS REGRESSION WITH A MODERATOR (RETURN VOLATILITY)

Variable	Model 1	Model 2	Model3	Model4
BS	.1634*	.4629***	.1617*	1790**
BI	-.1878**	-.19433**	-.1660**	-.1831**
BDU	-.0498**	-.05571**	-.0522**	-.1375**
RVOL	.2418**	.55305***	.27928***	.1849*
BS*RVOL		-.44476**		
BI*RVOL			-.1315*	
BDU*RVOL				.1175*
FS	.0424**	.04483**	.0388**	.0451**
ROA	-.2720*	-.28915*	-.2693*	-.249*
Tang	-.0978**	-.09713**	-.0936**	-.095**
TQ	-.0300*	-.031**	-.0315**	-.027*
FA	.1440***	.140***	.1443***	.145***
Industry &Year FE	Yes	Yes	Yes	Yes
_Cons	-.0798	-.2771	-.0195	-.0745
N	672	672	672	672
R2	.113	.123	.118	.118
R2_a	.109	.109	.105	.105
AIC	-206.50	-211.96	-208.71	-208.8
BIC	-161.40	-162.35	-159.10	-159.1
RMSE	.205	0.204	0.205	.205

legend: * p<0.05; ** p<0.01; *** p<0.001

Table (7) indicates that there is a negative impact of return volatility on the relationship between both BS, BI, and C (DTA) which is the coefficient value for the two models (2 &3) is (-0.447 & -0.1315) respectively) at 1%, and 5% levels respectively, but a positive impact of return volatility on the relationship between DU and CS is (0.1175) in the model (4) at the 5% level.

Also, results refer to there is a negative impact of BI, and DU on CS at a 1% level, while a positive impact of board size (BS) on capital structure in four models at 1%, and 5% levels.

Results show that higher board size leads to higher financial leverage so, the first sub-hypothesis H1a is accepted. Increasing non-executive directors' ratios leads to tend to use of less financial leverage to avoid raising risks from the use of high amounts of debt so, the second sub-hypothesis H1b is accepted. CEO duality leads to the use of small amounts of debt to avoid the pressures and risks resulting from the employment of high financial leverage. This result supports a resource dependency theory so, the third sub-hypothesis H1c is accepted. Return volatility has a positive impact on CS in four models at 1%, and 5% levels. This result supports the role of firms with high information asymmetry (increased return volatility) prefer high leverage so, the second hypothesis H_2 is accepted. According to control variables find both FS and firm age FA have a positive impact on CS in four models at 1%, and 5% levels while a negative impact of both Tang, ROA, and TQ on CS in four models at 1%, and 5% levels. This table shows that IA explains the relationship between BCH with higher than 10% (R^2=0.109) in four models, while AIC, BIC & RMSE values are very close to results for four models.

TABLE 8
ROBUSTNESS TEST

Variable	Model 1	Model 2	Model3	Model4
BS	.1636*	.5198***	.1626*	1751*
BI	-.1936**	-.1907**	-.1466*	-.1816**
BDU	-.0483**	-.0555**	-.0443**	-.1226**
TV	.2529***	.6420***	.3193***	.1948*
BS*TV		-.5583***		
BI*TV			-.1135*	
BDU*TV				.1021*
FS	.0417**	.0413**	.0406**	.0410**
ROA	-.2788*	-.2629*	-.2492*	-.2851*
Tang	-.1046**	-.1122***	-.1008**	-.1051**
TQ	-.0290*	-.0306**	-.0307*	-.0292*
FA	.1513***	.1425***	.1538***	.1434***
Industry &Year FE	Yes	Yes	Yes	Yes
_Cons	-.0915	-.2957	-.1066	-.0427
N	672	672	672	672
R2	.117	.133	.121	.123
R2_a	.105	.119	.108	.110
AIC	-209.38	-219.73	-210.73	-212.42
BIC	-164.28	-170.11	-161.12	-162.81
RMSE	.205	0.203	0.205	.204

Table (8) are consistent with all results in table (7), in which there is a negative impact of trading volume on the association between BS, BI, and CS for the two models, but a positive impact of trading volume on the relationship between DU and CS in the model (4).

Results indicate that there is a negative impact of BI, and DU on CS, while a positive impact of BS on CS in four models. Also, trading volume has a positive impact on CS in four models which increase trading volume means decreased IA and then a negative impact of IA on CS as well as FS and FA have a positive

impact on CS in four models while we find a negative impact of Tang, ROA, and TQ on CS in four models. This table is the best to explore the impact of IA on the association between BCH and CS in terms of (R^2) is higher than 12% in four models compared to 10% in table (7) as well as AIC, BIC & RMSE values are less in four models compared to the table (7).

DYNAMIC PANEL (GMM)

TABLE 9
GMM TEST

DTA	Coef.	St. Err.	t-value	p-value	[95% Conf	Interval]	Sig
BS	.556	.141	3.93	0.000	.279	.833	***
BI	-.338	.081	-4.19	0.000	-.496	-.18	***
BDU	-.818	.241	-3.40	.001	-1.29	-.347	***
TV	.282	.143	1.97	.048	.002	.561	**
BCTV	.438	.141	3.11	.002	.162	.715	***
FS	.022	.01	2.27	.023	.003	.042	**
ROA	-.194	.094	-2.05	.04	-.379	-.009	**
Tang	-.102	.024	-4.24	0	-.149	-.055	***
TQ	-.022	.008	-2.61	.009	-.038	-.005	***
FA	.147	.026	5.66	0	.096	.198	***
Constant	.258	.261	0.99	.323	-.253	.769	
Observations	672		Chi-square			74.980	

Table (9) is different from the results in both tables (7 & 8) in terms of the positive impact of trading volume on the relationship between BCH and CS. This result supports the view that the existence of IA decreases the relationship between BCH and CS.

However, these results agree with both of the results tables (7 & 8) which a negative impact of BI and DU on CS, while there is a positive impact of BS on CS. Also, IA (trading volume) has a positive impact on CS, and an increase in trading volume means a negative impact of IA on CS as well as FS and FA have a positive impact on CS, while a negative impact of Tang, ROA, and TQ on CS.

DISCUSSION

Results show BS has a positive impact on CS so, this result is consistent with (Abor, 2007; Gill et al., 2012; Heng et al., 2011), in which higher board size enhances strict control and force increased debts to maximize firm value, however, this result contradicts from some studies (Hasan and Butt, 2009), which large boards encourage management to cut debts to lower the danger of bankruptcy, particularly in large companies that rely heavily on internal finance.

Results refer to a negative impact of board independence on financial leverage, which supports (Wen et al.,2002) based on view that higher BI and control result in a tendency to utilize less financial leverage to reduce the risks associated with using large quantities of debt, however, this result contradicts from some studies (Sheikh and Wang, 2012 & Abor, 2007), which raising the number of non-executive directors on the board results in improved supervisory effectiveness and helps to lessen conflict between shareholders and managers, which increases financial leverage.

Firms endowed with strong corporate governance have a high level of achievements with less financial leverage such as stringent guidelines, the absence of many managers and several external directors on the board, and the CEO's acquisition of appropriate salaries and bonuses that force managers to use low amounts of debt. CEO duality is negatively associated with financial leverage (Sheikh and Wang, 2012),

which CEO duality leads to the use of small amounts of debt to avoid the pressures and risks resulting from the employment of high financial leverage. This result supports a resource dependency theory however, this result conflict with (Gill et al.,2012 & Abor, 2007), which CEO duality leads to increased debts by the CEO and chairman are the same person, which leads to the employment of high amounts of debt based on an agency theory.

Results indicate that information asymmetry contributes positively to financial leverage, supporting the literature that claims high leverage is preferred by firms with high information asymmetry (Gao and Zhu, 2015; Andres et al. 2014; Danso et al.,2019; Aflatooni and Khazaei, 2020). However, this result has no impact on financial leverage, which argued that firms have higher information asymmetry may prefer lower leverage (Stohs and Mauer, 1996; Berger et al., 2005: Fosu et al.,2016).

CONCLUSION

This study investigated the effect of information asymmetry on the association between board characteristics and capital structure. Financial leverage is measured with two indicators to get the best results in each model, which is measured by debt to assets (DTA) &debt to equity (DTE) as well as an information asymmetry measured by return volatility and trading volume to get the best results via robustness using Ordinary Least Square (OLS) & Generalized Method of Moment (GMM).

Board size is associated positively with financial leverage, in which large boards support a strong control and force to increase leverage to maximize firm value while boarding independence effects negatively on financial leverage, which increases the board independence ratio and leads to less financial leverage to avoid raising risks. Also, CEO duality is associated negatively with financial leverage, which CEO duality leads to a decrease in financial leverage to avoid the pressures and risks resulting from the employment of high financial leverage. Information asymmetry contributes to decreasing the association between board characteristics and capital structure.

REFERENCES

Abor, J. (2007). Corporate governance and financing decisions of Ghanaian listed firms. *Corporate Governance*, *7*(1), 83–92. https://doi.org/10.1108/14720700710727131

Adams, R.B., & Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics*, *94*(2), 291–309. https://doi.org/10.1016/j.jfineco.2008.10.007

Aflatooni, A., & Khazaei, M. (2020). Information asymmetry, leverage deviation, and leverage adjustment speed. *Asian Journal of Business and Accounting*, *13*(1), 1–34. https://doi.org/10.22452/ajba.vol13no1.1

Andres, C., Cumming, D., Karabiber, T., & Schweizer, D. (2014). Do markets anticipate capital structure decisions? - Feedback effects in equity liquidity. *Journal of Corporate Finance*, *27*, 133–156. https://doi.org/10.1016/j.jcorpfin.2014.02.006

Baker, M., & Wurgler, J. (2002). Market timing and capital structure. *Journal of Finance*, *57*(1), 1–32. https://doi.org/10.1111/1540-6261.00414

Barclay, M.J., & Smith, C.W., Jr. (1995). The maturity structure of corporate debt. *the Journal of Finance*, *50*(2), 609–631. https://doi.org/10.1111/j.1540-6261.1995.tb04797.x

Berger, A.N., Espinosa-Vega, M.A., Frame, W.S., & Miller, N.H. (2005). Debt maturity, risk, and asymmetric information. *Journal of Finance*, *60*(6), 2895–2923. https://doi.org/10.1111/j.1540-6261.2005.00820.x

Bessler, W., Drobetz, W., & Grüninger, M.C. (2011). Information asymmetry and financing decisions. *International Review of Finance*, *11*(1), 123–154. https://doi.org/10.1111/j.1468-2443.2010.01122.x

Boubakari, A., & Feudjo, J.R. (2010). Corporate Governance for the Best Financing Choices: An Empirical Study from Family Firms in Northern Cameroon. *International Journal of Economics and Finance*, *2*(2), 70–77. https://doi.org/10.5539/ijef.v2n2p70

Brennan, M.J., & Schwartz, E.S. (1984). Optimal financial policy and firm valuation. *The Journal of Finance*, *39*(3), 593–607. https://doi.org/10.1111/j.1540-6261.1984.tb03647.x

Danso, A., Lartey, T., Fosu, S., Owusu-Agyei, S., & Uddin, M. (2019). Leverage and firm investment: The role of information asymmetry and growth. *International Journal of Accounting and Information Management*, *27*(1), 56–73. https://doi.org/10.1108/IJAIM-10-2017-0127

Fama, E.F., & French, K.R. (2002). Testing trade-off and pecking order predictions about dividends and debt. *The Review of Financial Studies*, *15*(1), 1–33. https://doi.org/10.1093/rfs/15.1.1

Florackis, C. (2008). Agency costs and corporate governance mechanisms: Evidence for UK firms. *International Journal of Managerial Finance*, *4*(1), 37–59. https://doi.org/10.1108/17439130810837375

Fosberg, R.H. (2004). Agency problems and debt financing: Leadership structure effects. *Corporate Governance: The International Journal of Business in Society*, *4*(1), 31–38. https://doi.org/10.1108/14720700410521943

Fosu, S., Danso, A., Ahmad, W., & Coffie, W. (2016). Information asymmetry, leverage, and firm value: Do crisis and growth matter? *International Review of Financial Analysis*, *46*, 140–150. https://doi.org/10.1016/j.irfa.2016.05.002

Frank, M.Z., & Goyal, V.K. (2003). Testing the pecking order theory of capital structure. *Journal of Financial Economics*, 67(2), 217-248. https://doi.org/10.1016/S0304-405X(02)00252-0

Gao, W., & Zhu, F. (2015). Information asymmetry and capital structure around the world. *Pacific Basin Finance Journal*, *32*, 131–159. https://doi.org/10.1016/j.pacfin.2015.01.005

Gill, A., Biger, N., Mand, H.S., & Shah, C. (2012). Corporate Governance and Capital Structure of Small Business Service Firms in India. *International Journal of Economics and Finance*, *4*(8), 83–92. https://doi.org/10.5539/ijef.v4n8p83

Hasan, A., & Butt, S.A. (2009). Impact of Ownership Structure and Corporate Governance on Capital Structure of Pakistani Listed Companies. *International Journal of Business and Management*, *4*(2), 50–57. https://doi.org/10.5539/ijbm.v4n2p50

Heng, T.B., Azrbaijani, S., & San, O.T. (2012). Board of directors and capital structure: Evidence from leading Malaysian companies. *Asian Social Science*, *8*(3), 123–136. https://doi.org/10.5539/ass.v8n3p123

Jensen, M.C., & Meckling, W.H. (1976). Theory of the firm: Managerial behavior, agency costs, and ownership structure. *Journal of Financial Economics*, *3*(4), 305–360. https://doi.org/10.1016/0304-405X(76)90026-X

Jung, K., Kim, Y.C., & Stulz, R.M. (1996). Timing, investment opportunities, managerial discretion, and the security issue decision. *Journal of Financial Economics*, *42*(2), 159–185. https://doi.org/10.1016/0304-405X(96)00881-1

Kane, A., Marcus, A.J., & McDonald, R.L. (1984). How big is the tax advantage to debt? *The Journal of Finance*, *39*(3), 841–853. https://doi.org/10.1111/j.1540-6261.1984.tb03678.x.

Leary, M.T., & Roberts, M.R. (2010). The pecking order, debt capacity, and information asymmetry. *Journal of Financial Economics*, *95*(3), 332–355. https://doi.org/10.1016/j.jfineco.2009.10.009.

Miller, M.H. (1977). Debt and taxes. *the Journal of Finance*, *32*(2), 261–275. https://doi.org/10.2307/2326758

Modigliani, F., & Miller, M.H. (1958). The cost of capital, corporation finance, and the theory of investment. *The American Economic Review*, *48*(3), 261–297. Retrieved from http://www.jstor.org/stable/1809766

Modigliani, F., & Miller, M.H. (1963). Corporate Income Taxes and the Cost of Capital: A Correction. *The American Economic Review*, *53*(3), 433–443. Retrieved from http://www.jstor.org/stable/1809167

Mohamed, N., & Rashed, A. (2021). An investigation of the relationship between corporate social responsibility and corporate financial performance in Egypt: The mediating role of information asymmetry. *Journal of Accounting, Business, and Management (JABM)*, *28*(1), 73–86. https://doi.org/10.31966/jabminternational.v28i1.827

Mubeen, R., Han, D., Abbas, J., & Hussain, I. (2020). The effects of market competition, capital structure, and CEO duality on firm performance: A mediation analysis by incorporating the GMM model technique. *Sustainability*, *12*(8), 3480. https://doi.org/10.3390/su12083480

Myers, S.C., & Majluf, N.S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, *13*(2), 187–221. https://doi.org/10.1016/0304-405X(84)90023-0

Rashed, A., & Ghoniem, W. (2022). The impact of cash holding on stock returns in small and medium enterprises on the Egyptian Nile Stock Exchange. *Investment Management and Financial Innovations*, *19*(3), 83–92. http://dx.doi.org/10.21511/imfi.19(3).2022.08.

Rashed, A., Abd El-Rahman, E., Ismail, E., & Abd El-Samea, D. (2018). Ownership structure and investment efficiency: Evidence from Egypt. *International Journal of Accounting and Financial Reporting*, *8*(4), 1–22. https://doi.org/10.5296/ijafr.v8i4.13630

Ross, S.A. (1977). The Determination of Financial Structure: The Incentive-Signalling Approach. *The Bell Journal of Economics*, *8*(1), 23–40. https://doi.org/10.2307/3003485.

Shehata, W., & Rashed, A. (2021). Accounting Conservatism, Information Asymmetry, and Cash Holdings. *Journal of Accounting, Business, and Management (JABM)*, *28*(1), 63–72. https://doi.org/10.31966/jabminternational.v28i1.826

Sheikh, N.A., & Wang, Z. (2012). Effects of corporate governance on capital structure: Empirical evidence from Pakistan. *Corporate Governance (Bingley)*, *12*(5), 629–641. https://doi.org/10.1108/14720701211275569

Shyam-Sunder, L., & Myers, S.C. (1999). Testing static tradeoff against pecking order models of capital structure. *Journal of Financial Economics*, *51*(2), 219–244. https://doi.org/10.1016/S0304-405X(98)00051-8

Stiglitz, J.E. (1973). Taxation, corporate financial policy, and the cost of capital. *Journal of Public Economics*, *2*(1), 1–34. https://doi.org/10.1016/0047-2727(73)90008-X

Stohs, M.H., & Mauer, D.C. (1996). The Determinants of Corporate Debt Maturity Structure. *The Journal of Business*, *69*(3), 279–312. Retrieved from http://www.jstor.org/stable/2353370

Wen, Y., Rwegasira, K., & Bilderbeek, J. (2002). Corporate governance and capital structure decisions of the Chinese listed firms. *Corporate Governance: An International Review*, *10*(2), 75–83. https://doi.org/10.1111/1467-8683.00271