Are Corporate Dividend Policy, Earnings per Share and Share Price Affect Tax Aggressiveness Using Interest Coverage as an Intermediary Variable?

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Abstract

The purpose of this research is to investigate the interaction and the nature of relation between corporate dividend policy, earnings per share and the market price of the stock and planning of the corporate toward tax aggressiveness using interest coverage ratio as an intermediary variable. Ordinary least square regression model has been applied on panel data, it has been used to examine the required impact and to see how tax aggressiveness is significantly - and in what direction - affected by the management decision (agency theory) toward dividends payout and how the earnings per share and stock market price affect the tax planning in Egypt using a sample of 48 non-financial listed companies for the period of 2012-2019. This research runs three multiple regression models to examine the relationships between research variables. In cross-sectional tests, the statistical results indicate that earnings per share have a positive significant impact on interest coverage, while dividend payout, return on assets, return on equity and gross profit margin have a significant negative relationship with interest coverage.

The findings revealed that also that dividend payout; earnings per share, return on assets and gross profit margin have a positive significant impact on tax aggressiveness, while stock market price and return on equity have a significant negative relationship with tax aggressiveness. Furthermore, it was found that return on assets and gross profit margin have a positive significant impact on tax aggressiveness, while interest coverage and return on equity have a significant negative relationship with tax aggressiveness.

These results are important for investors who are most concern about the financial conditions of firms they are planning to invest in especially in emerging markets like Egypt. Firm's financial conditions determine the associated risks and, in turn the required rate of returns in terms of dividends payout and the share market price.

Keywords: Dividend Policy - Earnings per Share - Share Price - Interest Coverage - Tax Aggressiveness – Egypt

Introduction

Previous literature argued that, tax aggressiveness considered as a notorious effort done by firm's taxpayers in order to decrease their tax payable. It is by minimizing the firm's income and increasing their expenses without violating firm's taxation provisions at the risk of paying any penalty or suffering from any loss of

reputation if the tax regulators found out this fraud. There are many pugs in the tax regulation system, which can used by firm's taxpayers in order to evade the tax payment and reduce their liquidity problems such as the interest coverage which commonly in turn affect the firm's profitability, dividends, overall capital structure (Wang, 2015).

Previous scholars indicated to two types of tax aggressiveness. The first one is tax avoidance. Tax avoidance happens when the tax aggressiveness process is done without and violating on the provisions of taxation. The second type is tax evasion. Tax evasion occurs when the tax aggressiveness process violated the provisions of taxation (Kurniawan et al., 2017). Above that, there are two forms of tax aggressiveness. The first one is non-conforming tax aggressiveness and the second one is conforming tax aggressiveness (Mcguire et al., 2014). The non-conforming tax is a tax policy, which consists of minimizing the taxable income without adjusting the financial statement income. This strategy allows firms to increase its cash flow beside its benefit from the additional tax savings. Meanwhile, this strategy increases the risk to found out by the tax auditing authorities (Bird, 2018).

On the other hand, the conforming tax aggressiveness policy minimizes both taxable income and book income. By minimizing both of them, the risk of identified by tax auditing authorities is lower (Mills, 1998). In addition, the other risk is that aggressive firm tax behaviors of high-profile multinationals to become a reputation threat (West, 2018). Therefore, this strategy will affect the firm's profitability, liquidity, dividends and market share (Baudot et al., 2019). Hence, in literature, the association between these previous firm's financial elements and firm tax behavior beside its reputation is still inconclusive (Ostas et al., 2016).

According to agency theory, each individual in the firm considered as self-interested and there is a conflict of interest between stakeholders and the firm's executive management, which subsequently lead to agency conflict problem. This agency problem arise because of manages opportunistic behavior by managers who maximize their own wealth as opposed to the interests of other principals (Desai, 2005). Under the presence of this issue the minimizing of tax bill, the recalculation of the ratio of earning per share, share market price beside the liquidity such as interest coverage and the revenue such dividends will have a mutual impact on the selection of the firm's tax policies and planning strategy (Hong et al., 2017; Chen et al., 2017).

The agency conflicts and the opacity of tax policies beside highly might facilitate the manipulating in the resource-diverting activities. That because managers

motivated by their career concerns, beside, having their incentives to issue information that would only increases or decrease their financial statement ratios such as dividend policy, earnings per share, share price, and liquidity ratios (Hong et al., 2017). Hence, these would consequently s within the firm for an extended period would inflate firm value and at a certain time contribute to extremely negative consequences (Hutton et al., 2009).

Research Aim and Questions

The main aim of this research is to examine the impact of the corporate dividend policy, earnings per share and share market price on tax aggressiveness using interest coverage ratio as an intermediary variable. This research addresses the following three main questions:

1. What is the impact of corporate dividend policy on tax aggressiveness, using interest coverage as an intermediary variable?
2. What is the impact of earnings per share on tax aggressiveness, using interest coverage as an intermediary variable?
3. What is the impact of share market price on tax aggressiveness, using interest coverage as an intermediary variable?
4. What is the relationship between interest coverage and corporate tax aggressiveness?

Literature Review and Hypotheses Development

Dividend Policy, Earnings per Share and Share Price and Interest Coverage

Interest coverage ratio is used as profitability and debt ratio, as it is used to assess the risk of how easily a firm can pay interest on its outstanding debts. The interest coverage ratio (the times interest earned ratio) is a measure for how many times the firm can cover its interest from its current net operating income before interest and taxes, stakeholders and creditors commonly use this ratio to assess the firm' liquidity riskiness (Bernanke, 2010; Lansing et al, 2010). Most of Previous scholars handling the association between the firm's financial performance such as dividends, earning per share, beside share market price and its impact on the interest coverage ratio as a liquidity ratio. Such as **(**Giuseppe, 2014) empirically examine the agricultural firms which characterized by high investments in the capital equipment

element and which is determined by the production cycle, that commonly needs large liquidity, high investments and facilities.

These large investments require funding from both equity and debt capital, which subsequently might generates financial costs. Therefore, he argued that it is necessary to assess not only the results of the firm's financial performance but also financial sustainability by assessing the impact of the sector profitability elements on the firm's sustainable liquidity. In order to analyzing this issue, he developed an approach model by putting in comparison the interest coverage ratios calculated using different approaches. The results showed that firms in the agriculture sector should pay particular attention to its financial operation liquidity, in particular in dealing with the debt banks financing and he indicated that suggested approach could applied to other sectors, especially those firms with high market price beside high profitability.

Meanwhile, (lopes, 2019) investigated the interest coverage ratio in Europe. He found that there is no significant associating between interest coverage ratio and banks' lending activity. In additional, there is no impact from non-financial and financial ratios, beside aggregate perspective on interest coverage. Therefore, he recommended using the interest coverage ratio as a minimum regulatory requirement. On the same context (Li, 2017) examines the profitability creation process and it is complying with the firm' liquidity coverage ratio. He used a stock-flow based dynamic model of credit creation. He found that the profitability creation is associated with the firm's characteristics especially in private sector rather than their peers which monetary structural factors. In addition may be a credit a significant reduction in profitability ratios when the firm regulated by the interest coverage ratio.

Therefore, these previous results could lead to the probability of the mutual impact of the firm's ratio such as and the interest coverage ratio besides an insightful understanding on the impacts of firm's regulations on the stability of its profitability and liquidity. As the, the neglect of credit, creation and its possible impacts on firm's performance may cause an unanticipated consequence on the firm's overall performance. Moreover, the high firm's dividends have a strong positive explanation for the firm's future profit sustainability (Lee, 2008). In other words, the cash which generated from the operations such as (increasing in earning per share and market price), indicate to that the firm has the ability to generates enough cash, this cash, which needed for repayment of its debts, maintenance of its operating capacity,

distributing its dividends, and increasing investments without relying on any external financial resources (Choi, 2016; Burgstahler et al., 1997; Lee et al., 2010).

Above that, (Hyunm, 2019) examined the usefulness of two types of interest coverage ratio. The first one is the cash-based interest coverage ratio. The second is the accrual-based interest coverage ratio, which used as a tool for exiting insolvent firms. He analyzed whether the value relevance of market stock price differs according to various interest coverage ratios. He measured the cash-based interest coverage ratio by dividing the operations cash flows by the firm's interest payments, besides measuring the accrual-based interest coverage ratio by operating income divided by interest expenses using Ohlson model. As a result, he found that the cash-based interest coverage ratio used as useful information by the stakeholders in the capital market and considered as an indicator for the profit sustainability.

Based on the previous illustrated literature, the researchers formed the following three hypotheses:

H_1: Corporate dividend policy has significant impact on interest coverage.

H_2: Earning per share has significant impact on interest coverage.

H_3: Share market price has significant impact on interest coverage.

Corporate Dividend Policy and Tax Aggressiveness

One of the main complex firm financial decisions is the dealing with determine of the firm's dividend policy, that because, the trade-off between distributing funds to shareholders and to retain the profits within the firm. Marginal firm and individual tax rates considered as one of the main factors that firms ponder in such managerial decision, especially in countries with high tax rates. In these countries, firms might change their dividend policies in response to changes in the tax legislation, therefore a significant association between corporate dividend policy and tax aggressiveness (Zagonel, 2017).

Previous scholars such as (Vancin and Procianoy, 2016) found that the tax legislation has an important role in the dividend policy determination. They found that there is strong empirical evidence that firms paying dividends above the legal mandatory limit present different determinants from those that only pay the minimum limit. Thus, the mixes samples that mix firm which pay both the mandatory minimum dividend and above the minimum has a significant impact on the tax legislation.

Therefore, the previous result indicates that there is a significant and positive coefficient between both dividends and tax policies supported by (Ramos, 1997; Litzenberger and Ramaswamy's, 1979).

Furthermore, (Nossa, 2007; Mota and Eid, 2007; Nakamura et al., 2007) indicate that there is a significant association between the dividends distribution and tax policy analyzed the choice of the tax method of paying the firm's tax liability policy of from the three distribution options of dividends, they found that dividends are preferred to late its tax deduction advantage. In addition, (Pohlmann and Iudícibus, 2010) showed that there is a positive significant relationship between the tax level on income and both the dividends and debt level. These results also observed for firms with high debt beside low profit taxation. Hence, the previous results support the theory of trade-off considering the impact of taxation on profit over debt decision, and consequently over the overall firm capital structure.

On the same context, (Sari 2017) investigated the association between tax avoidance, related party transactions and the dividend policy. Beside, investigate the moderating effects of the corporate governance implementation between tax avoidance, related party transactions and corporate dividend policies in Indonesian Stock Exchange. He found that firstly, the greater tax avoidance that a firm makes would increase the size of the firm's related party transaction. Secondly, the higher that the firm has related party transaction is, this will decrease the firm's cash dividend rate. Thirdly, the greater the tax avoidance is, the lower the firm's cash dividend rate, which done through a related party transaction. Fourthly, the impact of the implementation of strong corporate governance will weaken the positive relationship between firm's tax avoidance and the firm's related party transactions size; beside strengthen the negative association between the related party transactions size and the firm's cash dividend policy. In addition, strengthen the negative relationship between the firm's tax avoidance and the firm's cash dividend policy, which mediated by the firm's related party transactions. In other words, there is an indirect association between tax avoidance and cash dividend payments, mediated by related party transactions. This result is supported also by (Prastowo, 2017).

As the same important (Martowidjojo et al., 2019) showed that profitability is the main financial aspect that determines a firm's dividend policy. They examined the role of profitability and tax as dividend policy in Indonesian listed firms. They argued that besides firm's profitability, Indonesian firms consider other financial performance elements, such as earnings contributed capital, prior year earnings, and

tax to determine their dividend policy. They justify these results as earnings reflect firm's real ability in order to pay its dividends, and the tax affects the number of dividends, which should paid.

Their result showed that prior year's earnings beside the contributed capital considered as the significant determinants of firms' dividend policy. Nevertheless, there is insignificant impact from the firm's tax policy role. Meanwhile, both earning and tax are significant. Their results concluded as the higher the firms' earnings, the higher the dividend payout ratio. On other hand, firm's tax policy, has a significant negative impact in some years of the sample observation, in other words, the higher firm's tax, the lower dividend payout ratio.

Based on the previous illustrated literature, the researchers formed the following hypothesis:
H_4: Corporate dividend policy has significant impact on tax aggressiveness.

Earnings per Share and Tax Aggressiveness

Many scholars argued that the accounting strategies influenced by financial performance and tax policies, both of which are inherently conflicted. Meanwhile, financial considerations often submerge tax considerations, as executives highly prefer to engage in financial practices that maximize their stakeholders' wealth, besides, reducing firm income taxes (Manzon et al., 2002). In addition, (Desai et al., 2007) argued that the aggressive tax practices increase in parallel earning per share in United States firms as impressed by managers' opportunistic behavior as explanatory factors for this association.

Above that, empirical literature supporting the adverse impact of tax aggressiveness on firm's behavior, for instance, (Baumann et al., 2017) found that subsidiaries of the multinational corporation in countries with strict enforcement tax strategies, and higher earnings per share, report higher pre-tax profit. In addition, (Bernard et al., 2018), suggested that increased this tax enforcement might result in decreased reported profitability, especially when there is a policy that enforcement requirement or certain tax disclosure. In such cases, firm's executive managers manipulate their firm size to avoid passing these enforcement strategies.

Furthermore, (DeBacker et al., 2015) argued that there is complexity in the association between the tax policies such as aggressiveness and firm behavior. They noted that firms calculate their profitability measured by the proxy of earning per

share based on whether the firm perceived from the rounded environment such as tax regulators and audit risk. As, if firms are in a high-risk group, they considers that probability when reporting their earning per share and consequently their taxes reporting. Firms, however, revise this reporting over time, based on whether they actually received. Moreover, they documented that firms decrease tax aggressiveness immediately after an audit, and then gradually increase it if there is no additional audit.

As the same important (Tennant, 2018) examines if the size influence the association between earning per share as a proxy for the firm profit and tax aggressiveness. They as a question of "How Large taxpayer units commonly used tool for enforcing tax compliance?". In addition, if these policy affected the firms' reported profitability and effective tax rate. They found that the large size impact the relationship between the earning per share and tax aggressiveness. As the larger taxpayer, units report higher pre-tax profit margin by 2–3 % according to their smaller peers. Thus, consequently influence the tax aggressiveness, besides increasing the effective tax rates.

Based on the previous illustrated literature, the researchers formed the following hypothesis:
H_5: Earning per share has significant impact on tax aggressiveness.

Share Market Price and Tax Aggressiveness

Considering the agency theory framework beside presence of conflicts of interest between both owners and managers, some scholars argued that tax aggressiveness activities might facilitate managerial activities opportunism such as resource diversion and earning manipulation (Chen et al., 2010; Desai et al., 2009). Hence, if managers accumulate bad news for a reporting financial period, therefore, the firm's share price would inflated and that in turn could create a bubble (Chen et al., 2017). When all negative reporting information reaches a certain point, thus consequently would leads to a share market price crash (Hutton et al., 2009).

Regarding the stock price crash, (Kim et al., 2011) defined stock price crash as the extreme negative firm- weekly returns. The reasons of stock price crash is to the sudden release of negative information that previously hidden from the market (Kim et al., 2013 Zhang, 2016; Hong et al., 2017; Cheng et al., 2018). Therefore, due to such news, outside stakeholders would rely on the available information. The lack

of information will consequently increase stock price, which, lead to a stock price crash (Veldkamp, 2006; Haggard et al., 2008; Hutton et al., 2009).

Nevertheless, some researchers focused on firm's tax aggressiveness policy taking in their consideration the agency theory conflicts (Armstrong et al., 2015; Richardson et al., 2014; Cheng et al., 2018). They argued that there is a positive significant association between firm's tax aggressiveness and share market price. In addition, they indicated that managerial opportunism might inflate stock price until an eventual future stock crash. On other hand, there is a pioneer scholar, which indicates that there is a mutual relationship between share market price and tax aggressiveness. Their results showed that tax aggressiveness activities are associated with an accumulation of firm's activities, practices and outcome such as market share price (Mcguire et al., 2014)

From pioneer literature paper, (Kim et al., 2011) who found that firms with lower cash effective tax rates beside the larger book-tax differences are highly tend to experience stock price crashes in the future. Moreover, they indicated that the tax aggressiveness measures could predict this crash risk as far as three future years into the future. Their results support that there is a mutual relationship between share market price and tax aggressiveness as same important (Chung et al., 2019) provided a strong evidence on this issue by indicating that tax aggressiveness has a positive significant associated with market share price. This association is more pronounced for firms with highly opaque information and less pronounced for the firm with more effective controlling monitoring. In addition, they establish that there is a positive significant relationship between firm tax aggressiveness and firm's insider sales volume in the fiscal year prior to a stock price crash.

Based on the previous illustrated literature, the researchers formed the following hypothesis:
H_6: Share market price has significant impact on tax aggressiveness.

Interest Coverage and Tax Aggressiveness

Theoretically, Top executives face struggles when taking the financial and tax strategies decisions (Shackelford et.al. 2001). If the executive one decides to increase the firm's income through manipulating the earnings management activities, then the firm's income tax payable that is reported will increases in turn. Meanwhile, if the executive one decides to decrease the firm's taxable income through taxes polices, then income reported will decreases. Previous scholars argued that tax incentives

make managers highly tend to delay their profits to periods of lower tax rate or to choose decreasing their earnings management (Houcin et.al. 2017).

Some studies show that there is negative association between interest coverage and tax aggressiveness policy (Erickson et al., 2004; Lennox et al., 2013). That occurs because it is difficult to report high income in line with low taxable income. Knowledgeable stakeholders, capital market regulators and tax authorities will become highly suspicious of firms that present their highly income and report its tax aggressively on same time (Dyck et.al, 2004; Desai, 2005). Considering that (Bulow et al., 1985), indicated that executive in this issues prefer to choose a substitution strategy for reporting both their interest coverage and tax their tax reporting policy. In other words, choosing reporting strategies, which can reduce the benefits the firms gain when, committed to other reporting strategies.

Practically, flexibility in the selection of accounting methods may potentially causes conflict between financial and tax policies reporting (Frank et al., 2009). For financial reporting purposes, firms tend to report a higher interest coverage rate to their shareholders and creditors, while for tax reporting purposes, firms highly tend to report a lower taxable income for their tax authorities. Nevertheless, executive are able to draw up financial statements and tax its returns in aggressive way at the same time in order to maximize their own utility. Consequently, thus may lead managers to increase their earning management by manipulating the expenses the firm paid beside the benefits the firm gains in the current and future tax periods (Houcine et.al. 2017; Frank et al., 2009; Lyon, 2014; Heltzer et al., 2015).

Furthermore, (Bulow et al., 1985) indicated that in such previous conditions, executive managers choose a complementary reporting strategy for reporting their tax, which do not reduce the firm's benefit, but instead complement each other. From the other hand, (Lee at.al. 2017) showed that there is a significant association between interest coverage and tax aggressiveness, that because the interest coverage rate considered as important information for the firms expected returns. That increase could be a sign for firm's future advancement in the fundamental financial performance, which subsequently affect the firm's tax aggressiveness.

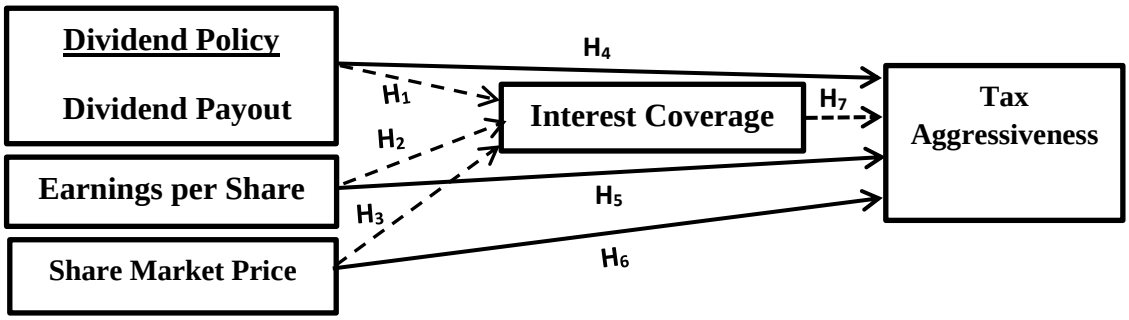
Based on the previous illustrated literature, the researchers formed the following two hypotheses:

H_7: Interest coverage has significant impact on corporate tax aggressiveness.

Research Conceptual Framework

In figure (1), we present the research conceptual framework to show the relationships between the research variables and hypotheses. The left side shows the firm' dividend policy, earnings per share and share market price (independent variables). The right side shows the corporate tax aggressiveness (dependent variable) and interest coverage as an intermediary variable.

Figure (1) Research Conceptual Framework



Research Methodology

This research conducted using data from 48 publically listed non-financial companies listed in the Egyptian stock exchange (EGX) from the year 2012 till 2019. We exclude those financial firms due to their distinct financial nature. Financial and secondary data were obtained from the financial statements and the published annuals reports.

Research Variables and Regression Model

The statistical relationship between corporate dividend policy, earnings per share and share market price on tax aggressiveness using interest coverage ratio as an intermediary variable was tested using the following three multiple regression models:

First regression model, used to examine the relationship between interest coverage and dividend policy, earnings per share and share market price.

H_1: Corporate dividend policy has significant impact on interest coverage.

H_2: Earning per share has significant impact on interest coverage.

H_3: Share market price has significant impact on interest coverage.

$$\mathbf{IC}_{it} = \boldsymbol{\beta_0} + \boldsymbol{\beta_1}\,\mathbf{DP}_{it} + \boldsymbol{\beta_2}\,\mathbf{EPS}_{it} + \boldsymbol{\beta_3}\,\mathbf{SP}_{it} + \boldsymbol{\beta_4}\,\mathbf{ROA}_{it} + \boldsymbol{\beta_5}\,\mathbf{ROE}_{it} + \boldsymbol{\beta_6}\,\mathbf{GPM}_{it} + \varepsilon_{it}$$

Where,

Dependent variable = Interest Coverage (IC**)** measured by interest coverage ratio.

$\boldsymbol{\beta_0}$ = Denotes a constant of the regression equation.

$\boldsymbol{\beta_1}$ = DP denotes regression coefficient of dividend payout.

$\boldsymbol{\beta_2}$ = EPS denotes regression coefficient of earnings per share.

$\boldsymbol{\beta_3}$ = SP denotes regression coefficient of share market price.

$\boldsymbol{\beta_4}$, $\boldsymbol{\beta_5}$ ***and*** $\boldsymbol{\beta_6}$ = denotes control variables, regression coefficient of return on assets (ROA), return on equity (ROE) and gross profit margin (GPM).

$\mathbf{I}_{it}$ = Firm i in period t.

$\mathbf{T_i}$ = Year fixed effect.

ε_{it} = Standard error term.

<u>Second: regression model, used to examine the relationship between tax aggressiveness and dividend policy, earnings per share and share market price.</u>

H_4: Corporate dividend policy has significant impact on tax aggressiveness.

H_5: Earning per share has significant impact on tax aggressiveness.

H_6: Share market price has significant impact on tax aggressiveness.

$$\mathbf{TA}_{it} = \boldsymbol{\beta_0} + \boldsymbol{\beta_1}\,\mathbf{DP}_{it} + \boldsymbol{\beta_2}\,\mathbf{EPS}_{it} + \boldsymbol{\beta_3}\,\mathbf{SP}_{it} + \boldsymbol{\beta_4}\,\mathbf{ROA}_{it} + \boldsymbol{\beta_5}\,\mathbf{ROE}_{it} + \boldsymbol{\beta_6}\,\mathbf{GPM}_{it} + \varepsilon_{it}$$

Where,

Dependent variable = Tax aggressiveness (TA**)**.

$\boldsymbol{\beta_0}$ = Denotes a constant of the regression equation.

$\boldsymbol{\beta_1}$ = DP denotes regression coefficient of dividend payout.

$\boldsymbol{\beta_2}$ = EPS denotes regression coefficient of earnings per share.

$\boldsymbol{\beta_3}$ = SP denotes regression coefficient of share market price.

$\boldsymbol{\beta_4}$, $\boldsymbol{\beta_5}$ ***and*** $\boldsymbol{\beta_6}$ = denotes control variables, regression coefficient of return on assets (ROA), return on equity (ROE) and gross profit margin (GPM).

$\mathbf{I}_{it}$ = Firm i in period t.

$\mathbf{T_i}$ = Year fixed effect.

ε_{it} = Standard error term.

Third: regression model used to examine the relationship between interest coverage and tax aggressiveness.

H_7: Interest coverage has significant impact on corporate tax aggressiveness.

$$TA_{it} = \beta_0 + \beta_1 IC_{it} + \beta_2 ROA_{it} + \beta_3 ROE_{it} + \beta_4 GPM_{it} + \varepsilon_{it}$$

Where,

Dependent variable = Tax Aggressiveness (TA).
β_0 = Denotes a constant of the regression equation.
β_1 = IC denotes regression coefficient of interest coverage.
β_2, β_3 *and* β_4 = denotes control variables, regression coefficient of return on assets (ROA), return on equity (ROE) and gross profit margin (GPM).
I_{it} = Firm i in period t.
T_i = Year fixed effect.
ε_{it} = Standard error term.

The definition and measurement of the variables used in this research are listed in table (1) as follows.

Table (1): Research Variables, Definitions and Measures

Variables / Type			Definition	Measure
Independent Variables	**Dividend Policy (Dividend payout)**	**DP**	Dividend payout ratio is used to show how much a company paid out as dividends from its net income to shareholders. This ratio is low, when the company retains earnings to invest in expansion and growth.	Dividend Payout ratio is calculated by dividing the cash dividend paid by net operating income after interest and taxes.
	Earnings per Share	**EPS**	Earnings per share indicate the corporate value by showing how much money a company earns for each share of its stock. Investors are willing to pay more share market price for a company's shares if they estimate that the company will potentially have higher profits relative to its share price.	EPS is measured by dividing the company net income after inters and taxes by the number of outstanding common shares.
	Share Market Price	**SP**	The stock market price is the price that it sells for on the open active market. It fluctuates throughout the trading day as investors purchase and sells shares.	To calculate the price of the share, the price to earnings ratio is used.
Intermediary Variable	**Interest Coverage**	**IC**	Interest coverage ratio (Times interest earned) shows how many times a company can cover and pay its current cost of outstanding debt with its available net income before interest and taxes. IC shows the margin of safety a company has for paying debt interest. The higher the ratio, the less the company is burdened by debt expense and more safety it enjoys.	Times interest earned is calculated by dividing the net income before interest and taxes by the interest expenses.

Dependent Variable	**Tax Aggressiveness**	**TA**	Tax aggressiveness often refers to the tax avoidance and it is part of tax planning. TA is considered as value enhancing activity as it focus on value maximization for investors as it shifts the wealth from the country to the company shareholders. Tax aggressiveness is an act that has the objective to reduce taxable income through tax planning as well as using methods that are either classified or not classified as tax evasion.	Tax aggressiveness tax is measured by effective tax rate (ETR). ETR equal income tax expense of operation (the income tax expense was reduced by deferred tax expense) divided by income before taxes.
Control Variables	**Return on Assets**	**ROA**	Return on assets reflects how a firm effectively and efficiently utilizes its available resources.	ROA ratio is measured by dividing net income by average total assets.
	Return on Equity	**ROE**	ROE means how the company' management is able to generate income from the investment of shareholders through increasing productivity and profits in a sustainable way.	ROE measured as a ratio by dividing the net income by average shareholder's equity.
	Gross Profit Margin	**GPM**	Gross profit margin ratio is used to evaluate the company's financial position. High gross profit margin ratio indicates is a signal effective and efficient management practices.	Gross profit margin ratio is measured by dividing net income by net sales.

Statistical Analysis and Results

Linear OLS Panel Regression Model:

Model Structure View:

Typically, data set has a cross sectional observations among different companies and re-sampled at a certain period of time, so a balanced Panel data regression will be most applicable to represent such a linear relationship and the model equation will be written as the following:

$$\hat{y}_{it} = \hat{\beta}_0 + \hat{\beta}_1 x_{1t} + \cdots + \hat{\beta}_i x_{it} + \epsilon_{it}$$

Where:

- $\hat{\beta}_0$: The estimated constant term.
- $\hat{\beta}_i$: The estimated independent Parameter coefficient.
- y: The dependent variable.
- x: The independent variable.
- i: The Country Number.
- t: Referring to the year.
- $\in$: Model white noise error.

Steps of constructing a Panel Regression Model:

- Set the time series variable and the cross-section variable in order to identify the panel regression model.
- Run a pooled Panel Regression in order to indicate the model significance results.
- Apply F-test to determine which more significant pooled or fixed model is.
- Apply Breusch-Pagan test to determine which is more significant Pooled or Random model is.
- Apply Hausman test to determine which is more significant Fixed or Random model is.

"In the three tests: Hausman test, F-test and Breusch-Pagan test if the p-value less than 0.05, then alternative hypothesis is accepted".

- **Pooled OLS:** is used as a simple estimator for panel data as it provides a baseline for comparison with more complex panel data estimators.

- **Fixed Effects** across individuals are constant, and **random effects** vary. A model with random intercepts a_i and fixed slope b corresponds to parallel lines for different individuals, or the model: $y_{it} = a_i + b_t y_{it} = a_i + b_t$.

- Run normality to make sure that Residuals variance is normal within your model.

- **<u>Performing the model diagnostics tests:</u>**
  - **White Stability test for random error variation:**
    The regression models and the OLS method are based on several assumptions, including the constancy of homoscedasticity by which the mean should be equal to zero, and if the Heteroscedasticity variation is used, some methods are used to overcome this problem, such as the White test. The null hypothesis is that the model has a problem of random error instability if p-value is greater than 0.05.
  - **Normality of residuals:**
    The residuals of the forecasting model must follow the normal distribution normal distribution in the long run with mean equals zero and variance equals one, a Chi-square test is used for testing the normality with the criteria that if the p-value is greater than 0.05 this means that the residuals are normally distributed.
  - **Ramsey RESET test for model specification:**
    This test is used to determine whether the model contains all the appropriate variables and excludes all irrelevant variables to ensure that the model estimated coefficients are not biased. This is done through the Ramsey RESET Test, and the decision criterion is to accept the null hypothesis that the study model includes all the appropriate variables P-value was greater than (0.05).
  - **Variance Inflation Factors:**
    Minimum possible value = 1.0 and the values > 10.0 may indicate a collinearity problem.
  - **Goodness of fit tests:**
    There are many measures of accuracy and performance of the forecasts. The most commonly used measures are the mean absolute error (MAE), root mean squared error (RMSE) and mean absolute percentage error (MAPE).

- Show the graphical representation of your forecasted values within the standard error of the model.

The three panel models for estimating the three multiple linear panel regression equations:

After applying the pooled panel regression for the three model and performing the panel models diagnostics it's found that the most fitted linear panel model for estimating Interest Coverage (IC) in model (1) and Tax Aggressiveness (TA) in model (2) is the Pooled linear panel model, while the Random Effect linear panel model is the most appropriate for estimating Tax Aggressiveness in model (3).

The two Pooled linear panel model for estimating Interest Coverage (IC) and Tax Aggressiveness (TA), and the Fixed Effect linear panel model for estimating Tax Aggressiveness (TA) all showed a high level or residuals stability for long run by using white test for Heteroscedasticity and Chi-square test for normality of residuals, Also the three models independent variables and controlling variables have showed a low level of VIF which means that the they don't suffer from multicollinearity, and finally Ramsey Reset test for irrelevant variables showed that all variables are relevant and there is no need for adding or removing variables from any of the three models.

The following three tables (2), (3) and (4) summarize the three linear panel models.

Table (2) shows the statistical results for the first regression model used to examine the relationship between interest coverage and dividend policy, earnings per share and share market price.

Table (2): Pooled Linear Panel Model for Estimating IC

Model	***Pooled Linear Panel***	**Dependent variable**		***IC***	**VIF Test**
Independent variables	***Coefficient***	***t-ratio***	***p-value***	**Significance**	
constant	0.147654	2.353	0.0073	Significant	
DP	−0.201806	−6.598	<0.0001	Significant	1.031
EPS	0.287767	7.6094	<0.0001	Significant	1.033
ROA	−0.452100	−5.4398	<0.0001	Significant	4.413
ROE	−0.771803	−2.928	0.0025	Significant	4.593
GPM	−0.245608	−2.3676	0.0035	Significant	1.125
Adjusted R-squared			44.11%		
Ramsey RESET overall Test			**F-test**	**P – value**	
			1.7125	0.183	
Overall test of Heteroscedasticity			**Chi-square**	**P – value**	
			22.021796	0.009329	
Normality of Residuals			**Chi-square**	**P – value**	
			601.307	0.072301	

Source: Prepared by the researchers.

From the previous table it is concluded that:

- The overall pooled model is significant with adjusted R-squared value of 44.11% which means that the significant independent variable and the controlling variables explain the change in the IC by 44.11%.
- All the independent variables and the controlling variables have significant impact on IC.
- Earnings per share have a positive significant impact on interest coverage, while dividend payout, return on assets, return on equity and gross profit margin have a significant negative relationship with interest coverage.
- **The overall equation for forecasting the IC is:**

$$IC_{it} = 0.147654 - 0.201806\, DP_{it} + 0.287767\, EPS_{it} - 0.452100\, ROA_{it} - 0.771803\, ROE_{it} - 0.245608\, GPM_{it}$$

Table (3) shows the statistical results for the second regression model used to examine the relationship between tax aggressiveness and dividend policy, earnings per share and share market price.

Table (3): Pooled Linear Panel Model for Estimating TA

Model	***Pooled Linear Panel***	**Dependent variable**		***TA***	**VIF Test**
Independent variables	***Coefficient***	***t-ratio***	***p-value***	**Significance**	
const	0.171337	10.64	<0.0001	Significant	
DP	0.586979	7.300	<0.0001	Significant	1.033
EPS	0.223881	3.212	0.0015	Significant	1.035
SP	−6.13771	−4.497	0.0004	Significant	1.004
ROA	0.178318	2.176	0.0408	Significant	4.413
ROE	−0.0277442	−2.251	0.0253	Significant	4.594
GPM	0.0956465	2.9705	0.0228	Significant	1.126
Adjusted R-squared			75.14%		
Ramsey RESET overall Test			**F-test**	**P – value**	
			1.09344	0.337	
Overall test of Heteroscedasticity			**Chi-square**	**P – value**	
			53.361102	0.001820	
Normality of Residuals			**Chi-square**	**P – value**	
			53.361102	0.001820	

Source: Prepared by the researchers.

From the previous table it is concluded that:

- The overall Pooled model is significant with adjusted R-squared value of 75.14% which means that the significant independent variable and the controlling variables explain the change in the TA by 75.14%.
- All the independent variables and the controlling variables have significant impact on TA.
- Dividend payout, earnings per share, return on assets and gross profit margin have a positive significant impact on tax aggressiveness, while stock market price and return on equity have a significant negative relationship with tax aggressiveness.

- **The overall equation for forecasting the TA is:**

$$TA_{it} = 0.171337 + 0.5896979\, DP_{it} + 0.223881\, EPS_{it} - 6.13771 SP_{it} + 0.178318\, ROA_{it} - 0.0277442\, ROE_{it} + 0.0956465\, GPM_{it}$$

Table (4) shows the statistical results for the third regression model used to examine the relationship between interest coverage and tax aggressiveness.

Table (4): Pooled Linear Panel Model for Estimating TA

Model	***Fixed Effect Model***	**Dependent variable**		***TA***	**VIF Test**
Independent variables	***Coefficient***	***t-ratio***	***p-value***	**Significance**	
const	0.171162	9.459	<0.0001	Significant	
IC	−0.172780	−2.116	0.0355	Significant	1.018
ROA	0.161379	2.115	0.0461	Significant	4.356
ROE	−0.270227	−2.468	0.0144	Significant	4.580
GPM	0.00141176	2.257	0.0202	Significant	1.124
Adjusted R-squared			60.35%		
Ramsey RESET overall Test			**F-test**	**P – value**	
			1.16587	0.313	
Overall test of Heteroscedasticity			**Chi-square**	**P – value**	
			16.423023	0.00229	
Normality of Residuals			**Chi-square**	**P – value**	
			5.895	0.05248	

Source: Prepared by the researchers.

From the previous table it is concluded that:

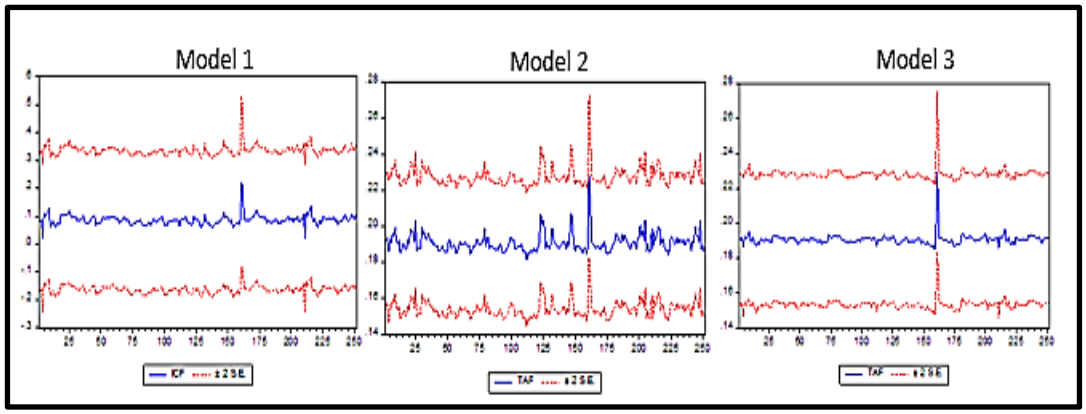
- The overall fixed effect model is significant with adjusted R-squared value of 60.35% which means that the significant independent variable and the controlling variables explain the change in the TA by 60.35%.
- All the independent variables and the controlling variables have significant impact on TA.
- Return on assets and gross profit margin have a positive significant impact on tax aggressiveness, while interest coverage and return on equity have a significant negative relationship with tax aggressiveness.

- **The overall equation for forecasting the TA is:**

$$TA_{it} = 0.171162 - 0.172780\, IC_{it} + 0.161379 ROA_{it} - 0.270227\, ROE_{it} + 0.00141176 GPM_{it}$$

The forecasting charts of the three linear panel models are presented in figure (2). The following charts presents the forecasting Interest Coverage (IC) and Tax Aggressiveness (TA) in the three models for the entire time series period from 2012 till 2019 for the 48 cross section company of sample.

Figure (2): The Forecasting Charts of the Three Linear Panel Models



Source: E-views software.

Table (5) summarizes the results of the three linear panel regression models and their hypotheses.

Table (5): Summary of the Three Linear Panel Regression Models and their Hypotheses

Variable	Model					
	First		Second		Third	
	Type	Significance	Type	Significance	Type	Significance
Overall Hypothesis	***Accept The Hypothesis***		***Accept The Hypothesis***		***Accept The Hypothesis***	
	Significant Relationship exists		Significant Relationship exists		Significant Relationship exists	
Sub Hypothesis	**Accept H1:** Corporate dividend policy has significant impact on interest coverage.		**Accept H_4:** Corporate dividend policy has significant impact on tax aggressiveness.		**Accept H_7:** Interest coverage has significant impact on corporate tax aggressiveness.	
	Accept H2: Earning per share has significant impact on interest coverage.		**Accept H_5:** Earning per share has significant impact on tax aggressiveness.			
	Accept H3: Share market price has significant impact on interest coverage.		**Accept H_6:** Share market price has significant impact on tax aggressiveness.			

Source: Prepared by the researcher.

Conclusion

This research examines the relationship and impact of the corporate dividend distributions policy, earnings per share and stock market price on tax aggressiveness using the interest coverage ratio as an intermediary variable in the Egyptian listed companies. Using a research sample of 48 firms during the period 2012-2019, we run a three multiple regression models. The statistical results revealed that, in average, earnings per share have a positive significant impact on interest coverage, while dividend payout, return on assets, return on equity and gross profit margin have a significant negative relationship with interest coverage.

Moreover, we found that dividend payout; earnings per share, return on assets and gross profit margin have a positive significant impact on tax aggressiveness, while stock market price and return on equity have a significant negative relationship with tax aggressiveness. in addition, results suggest that return on assets and gross profit margin have a positive significant impact on tax aggressiveness, while interest

coverage and return on equity have a significant negative relationship with tax aggressiveness.

Using higher corporate tax aggressiveness was for the shareholder benefit, as results suggest that tax aggressiveness is considered to be a beneficial firm financial and value-enhancing activity as tax planning allows the firm to save in tax liabilities which in turn provide the firm the ability to increase cash flows through tax savings. These results are important for investors who are most concern about the financial conditions of firms they are planning to invest in especially in emerging markets like Egypt. Firm's financial conditions determine the associated risks and, in turn the required rate of returns in terms of dividends payout and the share market price.

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