

Tax Avoidance Practises and Firm-specific Characteristics: Empirical Evidence from the Egyptian Listed Companies

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Abstract

Tax avoidance is the companies' action toward circumventing or mitigate their tax payment in legitimate way. Egypt suffers from higher rate of tax avoidance in the last decade due to a package of local and global events that might affect the financial stability of the Egyptian listed companies. The aim of this study is to assess the main determinants of the tax avoidance practise in the Egyptian context for the period from 2015 to 2018. To this end, the study utilizes the OLS regression with robust standard errors based on 672 firm-year observations. The results reveals that the tax avoidance practise in Egypt is a function of a set of firm-specific factors, namely financial distress, profitability, size and growth opportunities. Specifically, the companies suffering from higher financial distress have bigger tendencies to aggressively conduct their tax planning. Also, the highly profitable companies are more willing to engage in tax avoidance activities. In addition, the bigger the company's size, the higher motivation toward the tax avoidance practice. Similarly, the more potential growth opportunities companies utilize the higher the impetus to avoid the tax payment. Finally, the study could not find any association between capital intensity nor leverage and tax avoidance.

Keywords: Tax avoidance, financial distress, capital intensity, firm size, profitability, Egyptian listed companies.

الكلمات المفتاحية: التجنب الضريبي ، الضائقة المالية ، كثافة رأس المال ، حجم الشركة ، الربحية ، الشركات المدرجة في البورصة المصرية.

التجنب الضريبي هو إجراء تتخذه الشركات للتحايل أو التخفيف من دفع الضرائب بطريقة مشروعة. عانت مصر من ارتفاع معدل التجنب الضريبي خلال العقد الماضي بسبب مجموعة من الأحداث المحلية والعالمية التي قد تؤثر على الاستقرار المالي للشركات المصرية المدرجة. الهدف من هذه الدراسة هو تقييم المحددات الرئيسية لممارسة التجنب الضريبي في السياق المصري للفترة من ٢٠١٥ إلى ٢٠١٨. ولتحقيق هذا الهدف ، تستخدم الدراسة نموذج الإنحدار الخطي للمربعات الصغرى مع التحكم في الأخطاء المعيارية. بالإعتماد على ٦٧٢ ملاحظة على مستوى الشركة / السنة ، توصلت الدراسة إلى أن ممارسة التجنب الضريبي في مصر هي دالة لمجموعة من العوامل الخاصة بالشركة ، وهي الضائقة المالية والربحية والحجم وفرص النمو. على وجه التحديد ، الشركات التي تعاني من ضائقة مالية لديها دوافع أكبر نحو التجنب الضريبي. أيضًا ، الشركات ذات الربحية العالية أكثر استعدادًا للانخراط في أنشطة التجنب الضريبي. بالإضافة إلى ذلك ، كلما زاد حجم الشركة ، زاد الدافع نحو ممارسة التجنب الضريبي. وبالمثل ، كلما زادت فرص النمو المحتملة للشركة كلما زادت الرغبة نحو تجنب دفع الضرائب. أخيرًا ، لم تجد الدراسة أي ارتباط بين كثافة رأس المال أو الرافع المالي والتجنب الضريبي.

1. Introduction

Tax avoidance can be defined as all companies' initiatives to mitigate their tax payments relative to their earnings before tax (Dyreng et al. 2008, Bayar et al. 2018). It encompasses all management's actions to best utilize any weakness or shortage in the corporate tax laws and regulations to significantly reduce its explicit tax burden (Lietz, 2013 and Richardson et al., 2015a). Since taxes consume a significant amount of companies' income, they resort to tax management strategies such as tax avoidance to mitigate their payment (Ulfa et al., 2021). Tax avoidance permit companies to reduce or avoid paying their taxes in a legal and safe manner through taking the advantage of deficiencies in tax law and regulations (Napitupulu et al., 2019).

The agency theory provides a proper base for interpreting the companies' incentives to engage in tax avoidance activities. The agency theory is based on a central premise that both the agent and the principal are self-interested (Eisenhardt, 1989). The company' managers are the agent or the decision maker that would decide the policies toward tax planning activities. As the taxpayers, managers have strong incentives for tax avoidance activities since they help in mitigating the corporate tax in legitimate manner (Lanis and Richardson, 2012; Richardson et al., 2015 a; Dang and Tran, 2021). In addition, tax avoidance would help managers to boost their companies' income, maximize their bonuses and create good reputation in the shareholder's perceptions (Dang and Tran, 2021, Ulfa et al., 2021). Accordingly, the tax avoidance add value for companies' shareholders (Deef et al.,2021). On the other hand, the tax revenues are integral part in the governmental income needed for the economic expansion and for th infrastructure and investments development (Richardson et al., 2015a, Dang and Tran, 2021). Accordingly, the tax agencies, acts as the principal, are interested in maximizing the tax revenues to the extent possible (Ulfa et al 2021).

Egypt, as an emerging economy, greatly suffers from the tax avoidance activites. The gab in national tax law (Aldemrdash, 2020), the irregularities in the tax system (Ali et al.,2017), the stream of uncertainties associated with the radical economic and political events (Abdelfattah and Aboud,

2020 and Aladwey, 2021) are all contributed such end. The Egyptian government begin series of steps toward the economic reestablishment and ensuring a fairer and stronger tax system is critical step toward this end (Elnaggar ,2020; Aladwey 2021). Egypt takes serious action toward tackling the tax avoidance activities such as the issuance of the Unified Tax Procedure Law (UTP Law), No.206 in 2020; accompanied by a set of penalties for non-compliance taxpayers and engaging in global agreements to mitigate the companies' transfer of their profit to low-income countries. All such governmental initiatives toward mitigating the tax avoidance in indicate the Egyptian government's concerns about its bad consequences on the economy as the result of cutting the tax revenue generated.

The pertinent literature around the tax avoidance within the Egyptian context examines the association between corporate governance mechanisms and CSR disclosure in relation tax avoidance (e.g., Abdelfattah and Aboud, 2020; Abd-Elmageed and Ashour, 2021); the effect of equity ownership structure on tax avoidance (Deef et al. 2021; Elesdawy and Slem, 2021) and the relationship between the tackling of tax avoidance and the spread of digital economy (Aldemrdash,2020). Beyond these previous studies, this study aims at examining the main determinants of tax avoidance relative to the firm-specific characterises of the Egyptian listed companies.

Examining the firm specific factors that determine the practise of tax avoidance is still unsettled area in the pertinent literature subject to the contraindicated results generated. Habib et al., (2020) contend that there is no empirical evidence that indicate that the financially distressed companies would engage in tax avoidance activities to maintain cash for their own instead of swapping to tax agencies. While Lanis and Richardson (2012,2015); Richardson et al. (2015a) find positive association between the capital intensity and the tax avoidance, Maulana et al. (2018), Monika and Noviari (2021) and Ulfa et al. (2021) report non-significant association. In addition, Lanis and Richardson (2012, 2015) refer to the conflicting results in the literature regarding the association between the profitability and the tax avoidance. Regarding the firm size and tax avoidance, positive associations are reported by (e.g., Lanis and Richardson, 2012, Richardson et al.,2015a); while negative association are found by (e.g., Kim and Im,

2017, Sugeng et al. 2020), and a non-significant association are reported by (e.g., Kalbuana et al., 2020; Sugeng et al., 2020; Dakhli, 2021; Ulfa et al., 2021). Also, Salhi et al. (2020) reveals a positive association between leverage and tax avoidance for French companies but report a non-significance association for UK companies. Similarly, the growth opportunities positively influence the tax avoidance as evidenced by (e.g., Lanis and Richardson, 2012), while a non-significant effect is found by (e.g., Dang and Tran, 2021).

Based on a sample of 170 Egyptian listed companies, the main objective of the study is to address the associations between the firm specific characteristics of financial distress; capital intensity; profitability; size; leverage and growth opportunities and the tax avoidance. Through utilizing the OLS regression with robust standard errors and subject to 672 firm-year observations around Egyptian listed companies for the period from 2015 to 2018, the findings of this study can be summarized as follows. To begin with, a positive association is found between financial distress and tax avoidance practices. In addition, a non-significant effect of capital intensity over tax avoidance in the Egyptian context is reported. Furthermore, the profitability positively impacts the companies' intension to undertake the tax avoidance activities. Similarly, the firm size, proxied by natural logarithm of total assets, also augment the tax avoidance rate. Finally, although the companies' potential expansion has positive effect on tax avoidance, the leverage ratio has non-significance impact in this regard.

The remainder of this study is organized as follows. The second section addresses the institutional background of the tax avoidance practices in Egypt, reviews the literature around the tax avoidance determinants and develops the hypotheses. The third section describes the sample, defines the variables and explores the methodology. The fourth section discusses the descriptive statistics and the main results. The final section shows the conclusion.

2. Literature Review and Hypotheses Development

Reviewing the literature around the tax avoidance reveals two different views around its notion or core. The first view simply defines tax avoidance as the activities companies perform to reduce their tax payments within the legal boundaries by exploiting the holes and the weakness in the corporate

tax law (Napitupulu et al., 2019; Dakhli, 2021; Ulfa et al., 2021). Accordingly, tax avoidance does not entitle any violation of the tax provisions and regulations (Richardson et al., 2015a). Another view of tax avoidance is provided by Aldemrdash, (2020) that take into account the distinction between the legal and the unethical tax behaviors. That is, although the tax avoidance practices are conducted under the legal purview, it is considered unethical behavior since it is accompanied by taking the advantage of the gabs or the variations in interpreting the tax law (Aldemrdash, 2020). In similar vein, Abd-Elmageed and Ashour (2021) argue that the tax avoidance has two sides, that is it might be positively perceived as a well-organized mechanism to plan tax activities and manage its timely payment or negatively interpreted as actions to erode the tax payment by exploiting any gap in the corporate tax law.

Table I summarized the main determinants of tax avoidance in the pertinent literature. As demonstrated in Table I, it can be said that the literature is full of different initiatives to assess the main determinants of tax avoidance within the different settings, whether in developed countries such as {Australia (e.g., Richardson et al., 2015a); USA (e.g., Richardson et al., 2015b)}; or in developing countries such as {Korea (e.g., Kim and Im, (2017); Indonesia (e.g., Sugeng et al. 2020; Kalbuana et al. 2020) and so on...}. However, tracking such initiatives reveal the wide contradiction among different studies regarding the main factors that influence the tax avoidance practice as well as the significance and the direction of the association between such factors and tax avoidance. The following subsection highlights the key features of the tax avoidance practice within the Egyptian context. Afterwards, the next subsection reviews the literature around the examined factors that may affect the tax avoidance practices and postulates the main hypotheses.

Table I The Determinants of Tax Avoidance

Authors	Examined factors	Sample	Main Findings
Richardson et al. (2015a)	The aim is to address the impact of the global financial crisis in 2008 on the association between financial distress and tax avoidance in Australia.	The sample encompass 203 listed Australian companies for the period from 2006 to 2010.	The results indicate a positive association between financial distress and tax avoidance. Also, the results reveal the significance of such association during the global financial crisis in 2008.
Richardson et al. (2015b)	The aim is to assess the association of the financial distress and tax aggressiveness during the period of global financial crisis. with tax	The sample includes 12376 firm-year observations for US listed companies over 2006–2010.	A positive association is reported between the proxies of financial distress and global crisis form one set and tax aggressiveness from the other set.
Kim and Im, (2017)	The aim is to identify the financial determinants for tax avoidance in Korea.	The sample covered 18,954 firm-year observations of the Korean listed companies for the period from 2011 to 2013.	The results indicate that the corporate tax avoidance is mainly associated with certain firm specific factors such as companies 'size, profitability leverage, operating cash flow, capital intensity, R&D intensity and growth rate.
Tilehnooui et al. (2018)	The aim is to investigate the effect of financial distress on tax avoidance.	The sample includes the listed companies in Tehran stock exchange during the period from 2003 to 2013.	The results indicate the non-significance influence of the financial distress on tax avoidance.
Bayar et al. (2018)	The aim is to assess the association between tax avoidance and financial distress in the light of the surrounding corporate	The total sample encompasses 35,000 firm-year observations	A positive association between tax avoidance and financial distress in the case of poor governance structure. However, in the case of well-organized governance setting, tax avoidance does not negatively affect on the financial

	governance structure.	from 1990 to 2015 based on different international countries.	constraints.
Sugeng et al. (2020)	The paper aim is to assess the association between the companies' capital and inventory intensity; size; risk and political connections on tax aggressiveness.	The sample cover the Indonesian manufacturing listed companies for the period from 2015 to 2017	The paper concludes a positive effect of both capital intensity and political connection on tax avoidance and non-significance correlation between inventory intensity, companies' size and risk, and tax aggressiveness.
Kalbuana et al. (2020)	This paper aims at examining the main determinants of tax avoidance in relation to companies' capital intensity, size, and leverage.	The sample listed companies in Jakarta Islamic Index (JII) for the period of 2015 to 2019.	The results show that tax avoidance is positively associated with capital intensity; negatively associated with leverage and not significantly related to companies' size.
Ulfa et al. (2021)	The aim is to assess the effect of CEO tenure, capital intensity, and company size on tax avoidance	The sample includes manufacture listed companies on Indonesia Stock Exchange (IDX). for the year 2019.	The results indicate that although the CEO tenure positively influence on tax avoidance, both the capital intensity and firm size are not affecting companies' intention to avoid paying their due taxes.
Darsani and Sukartha (2021)	The aim is to examine the influence of four main variables, namely institutional ownership, profitability, leverage and capital intensity on tax avoidance.	The sample covers the Indonesian companies belongs to the mining sector for the period from 2015 to 2019.	The results indicate the positive influence of companies' profitability and capital intensity on tax avoidance; the negative effect of the institutional ownership on tax avoidance and the non-significant effect of leverage on tax avoidance.

1.1 Institutional background in the Egyptian context

Tax avoidance is one of the main gauntlets that face the Egyptian regulators and policymakers in the contemporary era¹. According to Aldemrdash (2020), based on a report issued by the Network Justice Tax, the cost of tax avoidance is estimated to approximately be 68 milliards in 2012 which constitutes one-third of the tax revenues generated of the same year. In addition, Gad et al., (2019) indicate that the tax avoidance practice is a primary factor behind the low tax revenue in Egypt as evidenced by the world bank report which manifests that the tax revenue is approximately 12.5% of the GDP relative to 15.4% in the OECD countries. In addition, based on data from the Egyptian listed firms for the period 2007–2016, Abdelfattah and Aboud (2020) indicate Egyptian listed companied may resort to obsessive CSR disclosure to conceal their tax avoidance practise and create a refined image of the companies in the public perception.

It is possible to address a lot of facets for tax avoidance in Egypt. First, the tax haven is one of the common practices in Egypt². It means the companies' transfer of their profit to other countries that estimate lower income tax rates (Deef et al., 2021). Second, the tax arbitrage gives some room for practising the tax avoidance in such companies would utilize the marginal tax rate by transferring their high taxable income to lower taxable income to take the advantage of lower tax rate (Ali et al. 2017 and Aldemrdash, 2020, Deef et al. 2021). The third example is the tax postponing to take the advantage of variation in the time value of money across different periods (Aldemrdash, 2020).

The diffusion of such practices in Egypt may be attributed to many factors as follows. First, the Egyptian companies may exploit gabs in the national law that permits them to establish secret offshore financial centres in lower tax countries so that they can avoid paying higher tax estimated according to the Egyptian corporate tax law (Aldemrdash, 2020). Second, the lack of well-organized documentation for tax statements for a huge number of

¹ <https://aps.aucegypt.edu/en/articles/556/why-cant-egypt-collect-taxes-efficiently>

taxpayers¹. Third, the success of any tax system is mainly dependent on the nature of the economic activities subject to this system (Aldemrdash, 2020) as well as the stability in its political system (Lietz, 2013). Although, compared to other countries in MENA region, the Egyptian Stock Exchange (EGX) is one the highly matured stock markets in the Middle East (Elsayed and Wahba, 2013), it suffers from many irregularities. That is, the Egyptian stock market is characterized by weak investor protection and high level of corruption (Abd-Elmageed and Ashour,2021) as well as the dominance of the institutional owners over the equity shareholding (El-Masry, 2010). In addition, Egypt has passed a critical period at the political level since the Egyptian' revolution in 2011, followed by another revolution in 2013 (Aladwey, 2021).

The Egyptian governments take radical actions toward tackling the diffusion of tax avoidance to increase its tax income revenue. This could be evidenced by the OECD/G20 inclusive framework that indicate that Egypt is one from 139 countries that recently issue fifteen corrective actions to mitigate the tax avoidance activities and settling the contemporary tax challenges². In addition, in 2020, the Egyptian government releases the UTP Law, No.206 for the purpose of amending the deficiencies in the income tax law³. For example, the Egyptian Tax Authority (ETA) permits the taxpayers to submit their tax statements within one year from the original submission date, otherwise they would lose their right of submission and would be penalized by being regarded as tax evader or getting a tax audit alert from ETA⁴. Furthermore, the UTP Law originates a series of financial penalties in the of the companies' non-compliance with such laws⁵ Additionally, with the cooperation of the OECD, the Egyptian Ministry of Finance has recently engaged in a European Union-funded (EU-funded) project that partially aim

¹ The same as 1.

² <https://english.ahram.org.eg/News/416425.aspx>

³ <https://www.pwc.com/m1/en/services/tax/me-tax-legal-news/2020/egyptian-government-issues-unified-tax-procedures-law-no-206-2020.html>

⁴ The same as 5.

⁵ <https://taxsummaries.pwc.com/egypt/corporate/tax-administration>

at enhancing more transparent tax reporting and helping the ETA to handle the aggressive tax planning schemes taken by the Multi-National Enterprises (MNEs)¹.

2.2 Hypotheses Development

2.2.1 Financial Distress and Tax Avoidance

Financially distressed companies are in badly need to minimize their cash outflows, and since the tax expenses consume a significant portion of companies' outflows, these companies become more inclined toward tax avoidance practices (Richardson et al. 2015a). According to Habib et al. (2020), companies suffering financial distress would engage in tax planning activities as a root to tackle such distress. Also, Richardson et al. (2015a) argue that the financially distressed companies may accentuate the importance of actions utilized to reduce their current income tax since such actions may be considered as an auxiliary strategy to pass this highly tension period. In addition, from cost versus benefit perspective, companies within the financial distress periods may be more willing to undertake actions such as tax avoidance that were previously considered as risky or costly as long as such actions are accompanied with higher potential benefits (Dang and Tran, 2021, Richardson et al. 2015a).

Subject to the International Monetary Fund (IMF)'s report issued in 2020, the Egyptian economy struggle to survive as the result of the variant political instability in the last decade. Beyond 2011, Egypt has witnessed highly tension period that is congested of many radical events at both economic and political levels, such as the two Egyptian revolutions in 2011 and 2013, the devaluation of the Egyptian pound in 2014 and the critical economic recovery initiatives and so on (Aladwey, 2021). Accordingly, subject to the atmosphere of the aforementioned instability in the economy, it is expected that companies suffering from financial instability are more

¹ <https://www.oecd-ilibrary.org/sites/b41691ae-en/index.html?itemId=/content/component/b41691ae-en>

oriented toward adopting more risky strategies and engaging in tax aggressiveness. Thus, the first hypothesis can be formulated as follows:

H₁: The financial distress is positively associated with tax avoidance for Egyptian listed companies.

2.2.2 Capital Intensity and Tax Avoidance

The capital intensity shows the percentage of fixed assets companies own relative to their total assets (Kalbuana et al., 2020). The depreciation expenses associated with the fixed assets would be deducted from the companies' total revenue generated, thus the higher the percentage of fixed assets and their corresponding depreciation expenses, the lower the taxable income and the tax rate applied (Kalbuana et al. 2020; Darsani and Sukartha, 2021). Based on the agency theory, the potential conflict of interest between the tax authorities and the taxpayers would compel companies' managers to manipulate their taxable income that is, for example, by taking the advantage of their depreciation expense to reduce their tax burden (Richardson et al. 2015a, Ulfa et al. 2021). Since managers are the decision makers, they would choose the accelerated depreciation methods that augment the depreciation expense in accordance with the useful life of the fixed asset (Richardson et al. 2015a). Thus, the higher the companies' capital intensity, the more their chance to mitigate the taxable income and in turn the tax payment. In addition, the pertinent literature provides empirical evidence of the positive association between capital intensity and tax avoidance (e.g., Lanis and Richardson, 2012,2015; Richardson et al. 2015a). Accordingly, the second hypothesis can be formulated as follow:

H₂: The capital intensity is positively associated with tax avoidance for Egyptian listed companies.

2.2.3 Profitability and Tax Avoidance

Based on agency theory premises, there a proper conflict between the tax authority (the principal) and the taxpayer or the company (the agent).

Although the tax authorities are pursuing to maximize the tax revenue to the extent possible, the taxpayer are searching for all the appropriate avenues to lessen their tax payments and at the same time maintain higher profit figures (Darsani and Sukartha, 2021). Consistently, Lanis and Richardson (2012) provide empirical evidence that the highly profitable companies have higher tendency toward tax avoidance practices to minimize their tax burdens. Similarly, Irianto et al. (2017) indicate a positive effect of ROA on tax avoidance. In addition, Kim and Im (2017) argue that companies that achieve higher profitability are more likely to resort to earning smoothing activities to avoid the payment of the corporate taxes. Furthermore, based on a sample of Egyptian listed companies, Abd-Elmageed and Ashour (2021) indicate that highly profitable companies tend to search for the possible avenues to avoid the tax payment. Thus, it is expected that the relationship between companies' profitability and tax avoidance as follows:

H₃: The companies' profitability is positively associated with tax avoidance for Egyptian listed companies.

2.2.4 Firm size and Tax Avoidance

The literature provides three mixed results regarding the association between firm size and tax avoidance activities as follows. The first strand of research argues a positive association between companies' size and tax avoidance that is the big size companies are more willing to engage in tax avoidance activities. Lanis and Richardson (2012) conclude that the larger the companies' size, the more aggressive the tax policy. Likewise, relative to the small size companies, Richardson et al. (2015a) argue that the financial resources and political power possessed by larger companies enable them to find several avenues toward reducing their tax obligations, thus they are more likely to be tax avoidant. In contrast, the second strand of research indicates the negative influence of companies' size on the tax avoidance. Kim and Im (2017) contend that small size companies are more oriented to capture the tax avoidance policies. As noted by Sugeng et al.

(2020), the negative association between the companies' size and tax avoidance may underpins the political power theory argument that the large size companies have political power that help them to suitably conduct tax planning initiatives to reduce taxes and to achieve optimal tax reduction. Accordingly, large size companies have lower incentives toward tax avoidance activities (Sugeng et al., 2020). The third strand of research indicate that the companies' size has no significant effect on tax avoidance (e.g., Kalbuana et al., 2020; Sugeng et al., 2020; Dakhli, 2021; Ulfa et al., 2021). Accordingly, the association between companies' size and tax avoidance is left without identifying the proper direction as follow:

H₄: Firm size is significantly associated with tax avoidance for Egyptian listed companies.

3. Research Design

3.1 Sample and Data

The sample encompasses the Egyptian listed companies in EGX stock market for the period from 2015 to 2018. Panel A, Table II summarize the sample selection process as follows. First, similar to Ramadan (2015); Shahwan (2015) and Aladwey (2021), the financial companies (39 companies) are excluded from the sample due to their unique regulations for the financial reporting and disclosure. Second, the companies with missing data (5 companies) are also excluded from the target sample. Data required for the measurement of the main variables utilized in this paper are collected the S&P Capital IQ database. Subject to the data availability, the sample covers four fiscal years from 2015 to 2018. The final sample includes 170 non-financial listed companies that yields 672 firm-year observations. Panel B, Table III demonstrates the categorization of the observations according to the different industrial sectors within the Egyptian market.

Table II. Sample Selection Criteria

Panel A: Sample selection criteria										No. of companies
The whole number of the Egyptian listed companies between 2015 to 2018										214
(-) Financial companies										39
Subtotal										175
(-) Companies with missing data										5
Final sample										170
Number of observations										672
Panel B: Sample according to the different industrial sectors										
Communication Services	Consumer Discretionary	Consumer Staples	Energy	Health Care	Industrials	Information Technology	Materials	Real Estate	Utilities	Total
16	124	120	8	60	92	12	126	110	4	672
2.38	18.45	17.86	1.19	8.93	13.69	1.79	18.75	16.37	0.60	100

3.2 Variables Measurement

The aim of the paper is to identify the main determinants of the tax avoidance practise in Egypt. Table III shows the measurement of the different utilized variables. The dependent variable is tax avoidance (TAX). Following Dakhli (2021), Deef et al. (2021), and Ulfa et al., (2021); TAX is measured as the current tax expenses deflated on the income before taxes. According to Lanis and Richardson (2012) and Dakhli (2021), TAX is the commonly used measure for tax avoidance in the pertinent literature since it demonstrates the whole set of tax avoidance strategies, whether permanent or temporary. It measures the companies’ ability to mitigate their tax payment figures compared to the earning before tax (Lietz, 2013).

The independent variables are financial distress, capital intensity, financial performance and firm size. First, to evaluate the companies’ likelihood of financial bankruptcy, we employ the revised Altman Z-score model (Altman et al. 1995). According to Jahan and Kabir (2019) and Shahwan and Habib (2020), the Altman Z-score model is one of the most popular models to assess the financial distress, that is appropriate for both manufacturing and non-manufacturing companies, as well as for companies working within emerging markets. The modified Z-score can be calculated using the following mathematical equation (Altman and Hotchkiss, 2006, p. 267):

$$Z\text{-score} = 3.25 + 6.56 (X1) + 3.26 (X2) + 6.72 (X3) + 1.05 (X4)$$

where

X1 = working capital/total assets

X2 = retained earnings/total assets

X3 = income before taxes and interest/total assets

X4 = book value of equity/total liabilities

Driven from Altman (1995) and Altman and Hotchkiss (2006, p. 268), the interpretations of the utilized Z-scores can be summarized as follows; the values of z-score greater than 5.85 demonstrate companies away from the bankruptcy risk or in the safe area; values between 4.15 and 5.85 indicates the companies' likelihood of bankruptcy or a gray area and values less than 4.15 means that companies are financially distressed or in distress zone. Second, the capital intensity (CAPINT) is measured as the companies' total fixed assets deflated by total assets (Prawati1 and Hutagalung, 2021 and Ulfa et al., 2021). Due to the accelerated depreciation expenses relative to total assets, it is expected that CAPINT positively influences TAX (Lanis and Richardson, 2015). Third, the companies' financial performance is measured using return on asset (ROA). It is calculated as the companies' net income divided by the total assets (Salhi et al., 2020; Darsani and Sukartha 2021). Fourth, similar to Salhi et al. (2020); Aladwey (2021) and Dakhli, (2021), the natural logarithm of total assets is employed as a proxy of the companies' size (SIZE).

In order to improve the predication accuracy of the regression model, the paper utilize two firm-specific factors as the control variables. First the financial leverage is used to control for the variation in the companies' risk (LEV). It is calculated as long-term debt divided by total equity (Lanis and Richardson, 2012, 2015). Salhi et al. (2020) indicates a positive association between LEV and TAX for French companies, while a non-significant association is found for UK companies. In addition, while Lanis and Richardson (2012) report a nonsignificant effect of LEV on TAX, Lanis and Richardson (2015) report a significant positive effect, implying that those companies that are mainly utilizing debt financing rather than equity financing would resort to the tax deductibility of the interest payments to satisfy their tax avoidance incentives. Accordingly, subject to these mixed findings, the direction of the association between LEV and TAX could not

be predicated. Second, the companies’ growth opportunities are proxied using the market to book ratio, MTB (Richardson et al., 2015 a,b). Similar to Dang and Tran (2021) and Darsani and Sukartha (2021), MTB is calculated as the market capitalization of outstanding shares divided by the equity book value.

Table III The Empirical Models and the Variables’ Definitions

$TAX_{it} = \alpha_0 + \beta_1 * Z_SCORE_{it} + \beta_2 * CAPINT_{it} + \beta_3 * ROA_{it} + \beta_4 * SIZE_{it} + \beta_5 * LEV_{it} + \beta_6 * MTB_{it} + \epsilon_{it}$		
Dependent Variable		
Tax avoidance (TAX)	It is calculated as the total tax expense divided by the pre-tax income.	Richardson et al. (2015a). Salhi et al. (2020) Dakhli, (2021) Darsani and Sukartha (2021) Trisanti (2021) Ulfa et al. (2021)
Independent Variables		
Financial distress (Z_SCORE)	A proxy of companies’ financial distress as measured by Altman and Hotchkiss (2006)’s model.	Altman and Hotchkiss (2006) Jahan and Kabir (2019) Ikpesu (2019) Shahwan and Habib (2021)
Capital intensity (CAPINT)	A proxy of companies’ capital intensity. It is calculated as total fixed assets scaled by total assets.	Darsani and Sukartha (2021) Trisanti (2021) Prawati I and Hutagalung (2021) Ulfa et al. (2021)
Profitability (ROA)	Net Income/ Total Asset	Salhi et al. (2020) Darsani and Sukartha (2021) Dakhli (2021) Trisanti (2021)
Firm Size (SIZE)	Log of Total Assets	Salhi et al. (2020) Dang and Tran (2021) Dakhli, (2021) Trisanti (2021) Ulfa et al. (2021)
Control Variables		
Leverage (LEV)	It is measured by deflating the long-term debt by the total assets.	Lanis and Richardson, (2012,2015) Richardson et al. (2015a). Kalbuana et al. (2020)
The growth opportunities (MTB)	The market value of shareholder equity/book value of shareholder	Richardson et al. (2015a,b). Dang and Tran (2021) Darsani and Sukartha (2021)

3.3 Regression Model Specification

The dataset encompasses 672 firm-year observation for the period from 2015 to 2018. In order to choose the appropriate regression model that accurately capture the features of the dataset, the paper follow the procedural approach of Dougherty (2011, p.527). Panel A, Table IV shows the tests conduct to identify the utilized regression model. To begin with, the Breusch and Pagan Lagrangian multiplier (LM) test is employed to compare the existence of the random effect versus to the Ordinary Least Squares (OLS) regression (Park, 2011). At the significance level of 1%, the results reveal that the null hypothesis of the LM test need to be rejected ($p\text{-value} < 0.000$). Accordingly, the random effect model is better than the OLS model (Park, 2011). As a further step, the Hausman specification test is used to address the random effect relative to the fixed effect (Dougherty, 2011 and Park, 2011). The $p\text{-value}$ of Hausman test is 0.010 which is lower than the significance threshold of 1%, implying that fixed effect model is preferred model than random effect. Finally, the fixed effect model is contrasted against to OLS using the F-test. At all significance level, the results indicate the null hypothesis of F-test is accepted (the $p\text{-value} < 0.663$), suggesting that the superiority of OLS over fixed effect model.

Table IV Tests Conducted for Model Specification and OLS assumption

Panel A Model Specification Tests					
Test / Results	Random Effect Test Breusch-Pagan LM Test	Random Versus Fixed Effect Hausman Test		Time-Fixed Effect Test F-Test	
	Prob > chibar2 = 0.000*	Prob>chi2 = 0.010*		Prob > F = 0.663	
Panel B: Assumption of OLS Tests					
Test / Results	Test for Normality Shapiro-Wilks Test	Test for heteroskedasticity Breusch-Pagan/Cook-Weisberg	Ramsey RESET test	Link test	
	Prob>z =0.000	Prob > chi2 = 0.084	Prob > F= 0.455	Items	P> t
				_hat	0.001*
				_hatsq	0.808
				_cons	0.845
Note: * p <.1					

Panel B, Table IV shows the additional tests conducted to justify the validation of the assumption of OLS model. First, the asymptotic significant value of 0.770 for the Shapiro-Wilks Test is greater than the identified significance levels of 1%, thus the dataset demonstrates the normal distribution pattern. Second, the Breusch-Pagan/Cook-Weisberg test for heteroskedasticity reveals the non-existence of heteroscedasticity in the regression model since the p-value < 0.084 is higher than the significance levels identified. Third, the Ramsey RESET test (the p-value < 0.455) and the check for model specification errors is conducted through Linktest command (p-value of `_hatsq` is < 0.808) and, at the 1% thresholds, the results indicate the regression model is appropriately specified. Finally, following Habbash et al., (2013) and Raweh et al., (2021), the paper addresses the use of the robust standard error version of OLS regression since it is more convenient in handling any potential effect of the autocorrelation.

4. Results & Discussion

4.1 Descriptive Analysis and correlation matrix

Table V shows the descriptive statistics for the utilized variables (mean, standard deviation, median, minimum, and maximum). In order to exclude any extreme values that may affect the analysis of the dataset, all variables are winsorized at 1% and 99% percentiles. Similar to Abdelfattah and Aboud (2020), all negative values for TAX at firm-year level are deleted and the rest values are winsorized. The minimum level of tax avoidance practice (TAX) for the Egyptian listed companies is 0.001 while the maximum value is 0.899 with average mean of 34.3. This result is compatible with the figures reported by Deef et al. (2021) who indicates that the average of TAX for Egyptian companies listed in the Egyptian Stock Exchange 100 (EGX 100) over the period from 2015 to 2019 is 34.8, indicating the tendency of Egyptian companies to pay their tax burden. The proxy of the financial distress, (Z-Score) is ranged between 5.49 and 13.07. Similar to the results of Ramadan (2017), the results reveal a low standard deviation of Z-Score of 2.34. This implies the minor variation in the degree

of the financial distress for the examined companies. The CAPINT for Egyptian listed companies is ranged from 9.3 percent to 79.7 percent with dispersion rate of 23.8 percent. The average capital intensity (CAPINT) is 42.1 percent, demonstrating that more than one-third of the total assets owned by Egyptian companies are categorized as fixed assets.

Regarding the control variables, the span of the profitability (ROA) of the Egyptian non-financial listed companies is between -5.3 percent to 16.7 percent with an average mean of 4.8 percent. This result may indicate the wide variation in the financial performance between the companies in the sample. The standard deviation of companies' size (SIZE) is 6.4 percent ranged from 19.1 percent to 38.7 percent. The financial leverage (LEV) is fluctuated around 0.1 percent where the lowest level 0 percent and the highest level is 1.8 percent. Finally, the mean value of companies' growth avenues (MTB) is 2.14 with the range slot between .11 and 7.72.

Table V The Descriptive Statistics

Panel A: Summary Statistics for the Variables						
	Obs	Mean	Std. Dev.	Median	Min	Max
TAX	672	.343	.287	.343	0.001	.899
Z_SCORE	672	9.04	2.34	8.96	5.49	13.07
CAPINT	672	.421	.238	.380	.093	.797
ROA	672	.048	.066	.037	-.053	.167
SIZE	672	2.88	.64	2.89	1.91	3.87
LEV	672	.04	.06	.0011	0	.18
MTB	672	2.14	2.48	1.14	.11	7.72

Table VI shows the correlation matrix and multicollinearity results for the main variables. Panel A, Table VI indicate that the multicollinearity problems do not matter, that is there is no relationship between the independent variables since the correlation is less than 0.8. Furthermore, Panel B, Table VI reveals that the variance inflation factors (VIFs) for the independent variables are all less than 10 and the tolerance levels are more than 0.2, implying that the non-presence of multicollinearity concerns.

Table VI The Correlation Results

	Panel A: Pearson Correlation							Panel B: Multicollinearity statistics	
	TAX	Z_SCORE	CAPINT	ROA	SIZE	LEV	MTB	VIF	Tolerance
TAX	1								
Z_SCORE	0.0270	1						2.6	0.38
CAPINT	-0.1030*	-0.4278*	1					1.86	0.54
ROA	0.1850*	0.3858*	-0.2473*	1				1.45	0.69
SIZE	0.2515*	-0.2826*	0.0766*	0.1612*	1			1.47	0.68
LEV	0.0338	-0.5288*	0.3924*	-0.2188*	0.2870*	1		1.67	0.60
MTB	-0.1349*	0.4984*	0.0816*	0.2670*	-0.2786*	-0.1665*	1	1.73	0.58
Notes: * represent significant at 1%.									

4.2 Discussion

Table VII depicts the results of the regression analysis. The results indicate the significant effect of the examined determinants, namely financial distress, capital intensity, profitability and firm size on the tax avoidance at significance level of 1% since the p-value<0.000. Based on 672 firm-year observations, the value of R-square is 17%. This implies that the examined factors interpret 17 % of the change in the pattern of the tax avoidance for the Egyptian listed companies.

Table VII The Regression Result

Variables	Results			
	Coef. Std.	Standard Errors	t	P> t
<i>Independent Variables</i>				
Z_SCORE	0.02044	0.007053	2.9	0.004*
CAPINT	0.081205	0.058799	1.38	0.168
ROA	0.479837	0.186008	2.58	0.010*
SIZE	0.110357	0.019552	5.64	0.000*
Control variables				
LEV	0.277278	0.214846	1.29	0.197
MTB	0.02007	0.005424	-3.70	0.001*
Year and industry effect	Controlled			
Number of Obs.	672			
P. Value	0.000			
R-Squared	0.17			
Note: * p <.1				

As expected, the results reveal a significant and positive relationship between Z_SCORE and TAX at significance threshold of 1% where $\beta_1=0.020$ and p-value< 0.004, accordingly H_1 is accepted. This finding implies that the higher the financial distress situations companies face, the higher their tendency to engage in tax avoidance practices. Similar results are also reported by Richardson et al.(2015a) and Dang and Tran, (2021). A possible justification could be driven from Brondolo (2009)’s work that argue that during the economic deficiencies periods, tax agencies are suffering from higher risk of companies’ tax non-compliance and greater taxpayers’ expectation for support to resolve the potential budget distress. In addition,

in the case of the tightness or the unavailability of credit avenues, the financially distress companies may make use of the tax avoidance as a possible technique toward financing their operations. Furthermore, during the financial crisis periods, companies with bad financial situations would squeeze their cash outlays in investment, technology utilized, and employment compared to other companies with good financial position (Campello et al., 2010). Similarity, Richardson et al. (2015a) provide an empirical evidence based on Australian sample that the rate of tax avoidance is augmented during the highly tension period such as the global financial crisis in 2008. In addition, within such crisis periods, financially constrained companies are engaged in tax planning strategies that may erode their tax payment and boost their cash inflows (Richardson et al. 2015a). Accordingly, since the Egyptian listed companies face instability in their earning or encounter lower credit rating predication during the sample period from 2015 to 2018 as the result of the local economic and political events as well as the global crisis of the pandemic covid-19, the positive and significant association between financial distress and tax avoidance seems reasonable for the Egyptian listed companies.

Regarding the relationship between CAPINT and TAX, the results in Table VII reveals a positive but non-significant association at the significance level of 1% in such $\beta_2=0.081$ and $p\text{-value}< 0.168$, thus rejecting H_2 . Similar results are reported by Maulana et al. (2018), Monika and Noviri (2021) and Ulfa et al. (2021). The logic rationalization for this result could be explained from two perspectives as follows. First, companies with higher capital intensity ratio would not resort to tax avoidance activities to erode their tax payment since their high figures of fixed asset and the corresponding depreciation expenses would mitigate their tax burden in legitimate way (Sonia and Suparmun, 2019). Similarity, Rifai and Atiningsih (2019) indicate that the higher the companies' investment in fixed assets, the higher the depreciation expenses and the lower the tax burden they bear. Thus, the capital intensity should not be associated with tax avoidance activities as long as the depreciation expenses themselves

would guarantee lower taxable income and in turn lower tax rate. second, Ulfa et al. (2021) argue that the non-association between capital intensity and tax avoidance is because companies usually utilize their fixed assets in their operation and not for the sake of getting lower tax burden as an act toward tax avoidance.

Similar to expectation, ROA is positively and significantly associated with TAX ($\beta_3=0.480$ and $p\text{-value}< 0.010$, thus accepting H_3 at significance level of 1%. Accordingly, the higher the ROA, the more likely that companies would avoid paying their taxes. Likewise, Lanis and Richardson (2012); Kim and Im (2017) and Abd-Elmageed and Ashour (2021) report also similar association between the companies' profitability and tax avoidance. This result is consistent with the agency theory notion of self-interest incentives for both the principle and the agent. While the tax authority strives to maximize the tax revenues, the companies' management is also attempted to magnify their earning income. As long as, the higher profit is accompanied with bigger tax burden companies should bear, it is expected that companies would resort to the tax avoidance activities to maintain higher earnings figures and cash flows (Kalbuana et al. 2020, Darsani and Sukartha, 2021). Correspondingly, Richardson et al. (2015a) argue that companies' managers may exploit any ambiguity or misinterpretations of the tax laws to mitigate the taxable income. Under the temptation of the considerable cost saving accompanied with tax avoidance activities, managers may be urged toward acting aggressively against the tax policy (Richardson et al., 2015a).

At significance level of 1%, the results also reveal that SIZE positively determine the tax avoidance activities ($\beta_4=0.110$ and $p\text{-value}<0.000$), thus accepting H_4 . Similarly, Richardson et al. (2015a), Irianto et al. (2017) and Salhi et al. (2020) report a significant positive association between the companies' size and tax avoidance. In addition, Deef et al., (2021) provide an empirical evidence based on a sample of Egyptian listed companies that large size companies are engaged in tax avoidance practise. A possible justification in this regard is that since the companies' managers act as the

agent against the tax authorities' objectives, they would exploit any possible avenues to save any deductible amounts from the achieved profit. Thus, managers will always pursue to avoid the tax payment. While the small size companies cannot ideally manage their tax planning because of the dearth of the competent managers, the bigger size companies are more capable to conduct their tax management plan in the light of the availability of highly qualified and skilled managers (Badertscher et al., 2013; Ulfa et al., 2021). Thus, it seems reasonable that the companies' size has positive influence of the tax avoidance activities.

With respect to the control variables, results indicate that there is non-significant association between LEV and TAX, suggesting that the tax avoidance activities are not affected by companies' borrowing policies ($\beta_5=0.277$ and p-value <0.197). Similar results are reported by Lanis and Richardson (2012) Darsani and Sukartha, (2021). The ratio of the long-term debt to total assets implies the companies' ability to cover their long-term borrowing obligations from the available asset. High debt borrowing is accompanied with higher interest expenses and in turn lower taxable income the companies should pay. According to Badertscher et al. (2013), companies with greater leverage may be redundant toward practicing the tax avoidance schemes because of the tax benefits they utilize from the debt financing. Table V shows that on average the Egyptian companies demonstrate a lower leverage rate of 4%. This minor figure of leverage indicates the lower interest expense in the manner that may not permit the Egyptian companies to make any tax avoidance activities through debt financing. MTB is found to be positively associated with TAX at significance level of 1% ($\beta_6=0.020$ and p-value <0.001). Similar result is reported by Lanis and Richardson (2012). Accordingly, the higher the growth opportunities companies have, the higher the incentives toward tax avoidance. This result may be reasonable since the companies' expansion plan require them to save sufficient money to finance their investments.

5. Conclusion

Tax avoidance is one the biggest challenges that face the Egyptian tax authority. Since the tax revenues contribute to a great extent in maintaining the economic reforms endeavours initiated by the Egyptian government, the tax regulators pay more attention to the different factors determine the tax avoidance activities. The aim of the study is to address the main determinant of tax avoidance with respect to the firm specific characteristics of the Egyptian listed companies for the period between 2015 to 2017. Based on 672 firm year observation, the study provides empirical evidence of the effect of specific companies' characteristics on the diffusion of tax avoidance practise in the Egyptian context. The study reveals that the companies' financial distress, profitability, size and growth opportunities positively influence the rate at which companies avoid paying their taxes. in contrast, the study indicates that neither the capital intensity nor the leverage ratio is associated with the tax avoidance practice.

The study contributes to the extant literature on two aspects as follows. First, it provides empirical evidence of the main determinates of tax avoidance in Egypt. It alerts the Egyptian government and other related regulatory bodies to the association between the characteristics of the Egyptian listed companies and their tendency toward avoiding the tax payment. This evidence should stimulate the tax regulators to take corrective remedies to handle the weakness or gab in corporate tax laws that Egyptian companies may exploit based on their unique characteristics. Second, subject to the crowded political and economic events surround the Egyptian market in the last period (Abdelfattah and Aboud, 2020; Aladwey, 2021), the study provides a clear picture of the firm specific factors that determine the change of the tax avoidance rate within the period from 2015 to 2018. This picture would help the Egyptian government endeavours toward tackling tax avoidance and enhancing more transparent tax environment.

The limitation of the study may open the door future research avenues as follows. First, the study examines the main determinants of tax avoidance in Egypt. While tax avoidance may be conducted within formal reforms, the tax evasion may unethically help companied to erode their governmental

resources, especially in developing countries (Dang and Hang (2021). Accordingly, it would be interesting if other researchers consider the implications and determinants of tax evasion within the Egyptian context. Second, it would be also interesting if future studies examine the association of firm specific factors other than those examined in this study that may affect the tax avoidance practise, such as liquidity, market share, operating cash flow and growth rate. Third, according to (Altman and Hotchkiss, 2006) and Richardson et al. 2015a, financial distressed companies are passing four consecutive stages, namely failure, insolvency, bankruptcy and default. Future research could consider the association of each stage of financial distress on the management' s attitudes toward tax avoidance.

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