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Does the firm's performance influence tax avoidance? A study in the Tunisian context

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Abstract: *: Previous studies have shown different results for the relationship between performance and tax evasion, both in terms of sign and significance. First, this paper examines the relationship between corporate performance, as measured by return on assets (ROA), and tax evasion, as measured by the effective tax rate (ETR). Based on a sample of 49 Tunisian listed companies from 2012 to 2018, this study uses fixed-effect regression. In a second step, this work adds an ROA square term to the model. This research examines whether the relationship between ROA and RET is a quadratic relationship with this completed model. The results show that the relationship between firm performance and tax evasion is negative and significant. The results support the theory of political power. The fixed-effects regression results provide the reasons for a non-linear relationship. This paper shows that the relationship between ROA and REE is a U-shaped relationship. This paper builds on previous research by examining the relationship between firm performance and tax evasion, and is a contribution to the literature and policy makers. To my knowledge, there are no studies that focus on the association between tax evasion and firm performance as a variable of interest in Tunisia.*

Key Words: firm performance, tax avoidance, political power theory, political cost theory, Tunisian context.

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1. INTRODUCTION

Tax avoidance is now a real and international problem. Distortions in tax systems create opportunities for tax avoidance (Kari, 2015). Research suggests that several factors influence tax avoidance (e.g. Hanlon and Heitzman, 2010; Lee and Swenson, 2012; Delgado et al., 2012; Delgado et al., 2014). The "firm performance" factor has mixed results; both positive and negative (see Appendix-Table A). This article examines the relationship between firm performance and tax avoidance. This work examines why the results of previous studies are inconclusive, introducing the possible non-linearity of the relationship between firm performance and tax avoidance. There are two theories that provide a possible explanation of the relationship between performance and tax avoidance: political cost theory and political power theory. The political cost theory suggests that better firm performance leads to lower tax avoidance in order to avoid attracting the attention of politicians (Watts and Zimmerman, 1986). Political power theory suggests that better firm performance leads to greater tax avoidance because of the availability of resources, the hiring of tax experts, etc. (e.g., Siegfried, 1972; Guha, 2007; Belz et al., 2018). A twofold question arises: firstly, which theory supports this association; secondly, is this association necessarily linear? This article examines the possible association using data from firms listed on the Tunis Stock Exchange.

This article contributes to the literature on the determinants of the effective tax rate (ETR) in Tunisia and generally speaking in emerging economy (Salihu Ibrahim et al., 2013) .In addition to research methods on the determinants of the ETR, research results, policy and knowledge of tax avoidance need to be studied and improved in order to be used by policy makers.

Little research on tax avoidance has been conducted in Tunisia (Omri and El Aissi., 2012). many studies in the Tunisian context have ignored the profitability ratio (e.g Aliani.,2014; Assidi et al.,2016;Aliani, et al.,2016).Similarly, previous studies on tax avoidance do not provide conclusive results on the association between business performance and tax evasion (see Appendix-Table A).

Gaaya et al (2017) study the effect of family ownership on corporate tax evasion. They also investigate whether the quality of auditing affects tax evasion practices of family firms in the Tunisian context. Most of the studies (see Appendix-Table A) focus on the relationship between six determinants, namely size, leverage, capital intensity, stock intensity, profitability and the statutory corporate tax rate and/or the effective corporate tax rate. Delgado et al (2014) use quantitative regression to study different levels of the dependent variable, the ETR. The study reveals some non-linear relationships between the six determinants and the ETR. This research uses a different approach for an independent variable, in this case firm performance as measured by return on assets, to focus on an explanatory factor. Another originality of this paper is that document tests a possible non-linear relationship between firm performance and tax avoidance using the method of Lind and Mehlum (2010). To my knowledge, there are no studies on the determinants of ETR using the Lind and Mehlum (2010) method.

This study is divided into five sections. Section 2 describes the theory behind business performance and tax avoidance and provides the research hypothesis. The research design, the regression model and the description of the sample selection are presented in Section 3. Section 4 contains the results. Section 5concludes this study.

2. THEORIES AND HYPOTHESIS DEVELOPMENT

Two theories that found the relationship between firm performance and tax avoidance: Political cost theory and Political power Theory. However, several empirical studies investigating the relation between taxes and firm performance do not find any relation or come to inconclusive results (e.g. Armstrong et al., 2012; Cao and Cui, 2017).

2.1. POLITICAL COST THEORY

There is a great deal of research on the relationship between company size and the burden of government regulations and pressures. Aichian and Kessel (1962) have shown that very high-profit companies face government interference through regulation and public pressure. Jensen and Meckling (1978) have also pointed out that because large firms are more visible. This principle was retained by Watts and Zimmerman (1978) in the development of positive accounting theory.According to these two authors, managers seek to maximize their own usefulness by using accounting standards in their own interest. Watts and Zimmerman (1986) support this theory with three hypotheses, the bonus plan hypothesis, the debt/equity hypothesis and the political cost hypothesis (also called also the size hypothesis).According to the political cost hypothesis, the larger the size of the firm, the greater the tendency for managers to reduce reported revenues by using accounting standards to avoid attracting the attention of politicians (Watts and Zimmerman, 1986). The political process takes the form of a contest of wealth transfers (Watts and Zimmerman, 1986). Wealth transfers can be either negative (political costs) or positive (political benefits) (Zimmerman, 1983). Corporate taxes and compliance costs are political costs. While subsidies and the receipt of contracts or other payments are political benefits (Mills, Nutter and Schwab, 2012) companies are looking for a positive net wealth transfer. For example, taxes are paid to avoid larger negative net wealth transfers (Mills, Nutter and Schwab, 2012). The larger and more profitable the company is, the less tax evasion is practiced in order to avoid political control. Political control can be achieved by adopting other laws or policies resulting in a lower or negative net wealth transfer (e.g. Zimmerman, 1983; Rego, 2003; Mills, Nutter and Schwab, 2012). Still, low-profit firms tend to avoid taxes to retain some of their after-tax profits (Watson, 2015). Smaller and less profitable firms are also less exposed to political control. This allows them to avoid more taxes at a lower political cost compared to firms with high profits that are subject to greater political control (e.g., Zimmerman, 1983; Mills, Nutter and Schwab,2012; Watson, 2015). In the Tunisian context, Omri and El Aissi (2012) find that the extent of tax

evasion increases with the profitability of the company. In this paper, political cost theory suggests that better firm performance leads to reduced tax avoidance and vice versa.

2.2. POLITICAL POWER THEORY

The opposite view is the theory of political power. This view was first developed by Siegfried in 1972. This author argues that large firms have a lower ETR than small firms. There are three reasons for this. Larger companies have more resources. First, these resources allow them to influence the political process in their own interest (Siegfried, 1972) for example through lobbying activities (e.g. Guha, 2007; Belz et al., 2016). Second, these resources make it possible to acquire and hire experts in tax planning (Siegfried, 1972). Thirdly, regulation of firm activities in the sense of optimizing and saving taxes is more possible for larger firms with more resources (Siegfried, 1972).

Several authors have studied the relationship between firm size and tax avoidance; Many studies point to a negative relationship between firm size and ETR (e.g., Richardson and Lanis, 2007; Lee and Swenson, 2012). However, political power theory is also interested in the relationship between firm performance and tax avoidance. Firms with better performance have more resources in most cases. More resources are the sine qua none condition for all three hypotheses. The predictions of political cost theory are opposed to those of political power theory.

2.3. Inconclusive Empirical Research on the Effect of Firm Size on ETR

In the literature, the results are different but inconclusive as to the direction of the relationship between firm performance and tax avoidance. For example, Bao and Romeo (2013) confirm the political cost theory for only the top 5 per cent of firms in their data set. Wu et al. (2012) find that political cost theory applies to private firms, while political power theory applies to state-controlled firms. Holland (1998) finds a negative and significant relationship only for the 4-year period (1978-1981) in her work that covers a 26-year period (1968-1993).

Stickney and McGee (1982) and Shevlin and Porter (1992) find no significant differences in the ETR between large and small firms. For additional studies that do not find a relationship between size and ETR or that find inconclusive results. In the Tunisian context, Omri and El Aissi (2010) sought the determinants of the fiscal management of results. The authors find that the insignificance of the variable ROA.

But in any case, both theories give reasons to establish a link between firm performance and tax avoidance (Figure 1). This presumption leads to the following hypothesis:

H0: Firm performance is associated with tax avoidance.

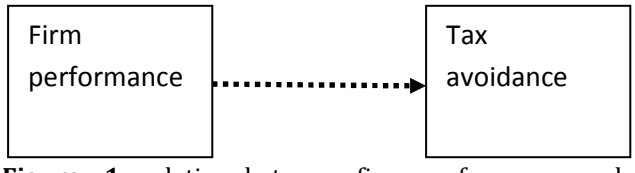

Figure -1: relation between firm performance and tax avoidance

The objective of this study is to examine whether corporate performance is associated with tax avoidance. The possible sign of the relationship provides insight into the theory behind the relationship.

3. RESEARCH DESIGN

This section discusses the design of the study. The first sub-section deals with the selection of the research sample. The second sub-section presents the regression model of the analyses and the third sub-section discusses the measurement of tax avoidance. The fourth subsection describes the measurement of business performance. The fifth subsection discusses the control variables added to the regression model.

3.1. SAMPLE SELECTION AND DATA COLLECTION

This work uses a convenience sample. This method has the advantage of ease of application. The sample was collected from the Tunis Stock Exchange, motivated by the availability of data. It was initially composed of 83 companies operating in Tunisia over the 2012-2018 period. The initial sample was then reduced by excluding firms in the following categories:

Financial and insurance companies:

Financial and insurance companies are excluded from the final sample because they are subject to different regulations, which can lead to misinterpretations and conflicting results (Gupta and Newberry, 1997; Kim and Limpaphayom, 1998; Buijink et al., 1999; Richardson and Lanis, 2007). This research keeps 55 companies.

Enterprises with missing data in the reference period:

The initial sample included businesses with missing data and these businesses were removed from the data set, creating a sample of 49 companies with data for the entire 7-year period.

The next step is to exclude observations that distort the data (see Table 1). Consistent with Zimmerman (1983), this document removes firm years with a negative tax burden because these firm years receive a tax refund and do not indicate the actual tax liability for the year. This study also excludes firm years with a pre-tax loss to avoid noise in the data (Zimmerman 1983). After these steps, the variables are calculated as described in the subsections below.

Following further research (e.g., Gupta and Newberry, 1997; Fernández-Roderíguez and Martinéz-Arias, 2014; Dyreng et al., 2016) this paper avoids the influence of extremely high values of GAAP ETR on the result. For this reason, observations with a GAAP ETR greater than one are deleted. The sample selection process results in a sample of 312 observations and 49 companies. Table 1 summarizes how the final sample was constructed.

Table -1: Sample selection procedure

Companies listed on the BVMT at 31 December 2018	83
Drop financial companies listed at 31 December 2018	(27)
Initial Sample	55
Less firm-years with missing data	(6)
Final sample	49
Initial number of observations (over 7 years)	343
Less firm-years with tax expenses < 0	(20)
Less firm-years with earnings before tax < 0	(9)
Less GAAP ETR>1	(2)
Initial number of observations	312

3.2. ECONOMETRIC SPECIFICATION

The basic regression model of this study is:

$GAAP\ ETRi = \alpha_i + \beta 1\ ROAi + \beta 2\ SIZEi + \beta 3\ LOSSi + \beta 4\ LEVi + \beta 5\ CAPINi + \beta 6\ INVINi + \beta 7\ RDINi + \beta 8\ PROVi + \varepsilon_i$ (1)

The study data are collected from the financial statements published on the website of the Tunis Stock Exchange (http://www.bvmt.com.tn).

The data processing was carried out with the software SPSS 9.0 . This software was chosen for its effectiveness in making cross-tabulations of different study variables.

The variables in the research model are presented in Figure 2 below.

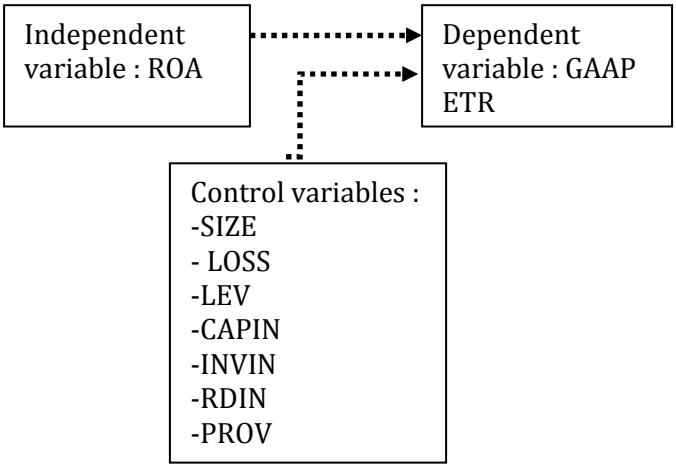

Figure -2: relation between ROA and GAAP ETR taking into consideration the control variables

3.3. DEPENDENT VARIABLE: GAAP EFFECTIVE TAX RATE

The dependent variable is tax avoidance. Estimation is required to measure tax avoidance (Hanlon and Heitzman, 2010).There are various indicators of tax evasion (Wang et al., 2019; Gebhart ,2017). Measures of the effective tax rate are highly responsive and widely used measures of tax avoidance (e.g. Hanlon and Heitzman, 2010; Dyreng et al., 2016). The GAAP effective tax rate (GAAP ETR) is used because of the availability of data for this measure in the financial statements. The GAAP effective tax rate is "total worldwide income tax expense divided by total worldwide accounting income before tax" (Hanlon and Heitzman, 2010, pp. 139-140). Total worldwide tax expense is all taxes (on income and revenue) relating to a given accounting period, whether paid, deferred or accrued (Valentino, 2016).GAAP ETR is the average tax paid per monetary unit of income (Hanlon and Heitzman, 2010). The ETR under GAAP is calculated for each year of research. GAAP ETR is a proportionally inverse measure of tax avoidance. A lower level of GAAP ETR means a higher level of tax avoidance and vice versa .The difference between the statutory tax rate and the GAAP ETR is a sign of tax avoidance in reality.

3.4. INDEPENDENT VARIABLE: FIRM PERFORMANCE

The independent variable is the company's performance. This research measures firm performance through return on assets (ROA), consistent with many other studies (e.g., Minnick and Noga, 2010; Armstrong et al., 2012; Dyreng et al., 2016). This variable is calculated as the return on assets by dividing net income by total assets (Valentino, 2016). ROA is a good measure of corporate performance because ROA reflects the decisions of managers (Vintilă et al., 2017). This document do not use return on equity (ROE) because this ratio measures shareholder decisions (Vintilă et al., 2017) and is not important for this research.

3.5. CONTROL VARIABLES

This study introduces seven control variables into the regression model. The control variables are used to account for omitted variables correlated on the results (Field, 2018). The control variables are based on related and previous studies (see Appendix-Table A). Size (SIZE) is the first control variable, measured as the natural logarithm of total assets. The second control variable is a loss dummy variable equal to 1 if the firm had a net operating loss in the previous year and 0 otherwise (LOSS) (Lazăr ,2014).The fourth control variable is the capital intensity ratio (CAPIN), which is measured as tangible capital assets divided by total assets. The fifth control variable is the inventory intensity ratio (INVIN), which is measured as the value of inventory divided by total assets according to (Valentino, 2016). The sixth control variable is the R&D intensity ratio (RDIN) which is measured as the value of R&D expenditures divided by total assets. The seventh control variable is the provision ratio (PROV), which is measured as provisions divided by total assets. As other research has shown (e.g., Zinn and Spengel, 2012; Lazăr, 2014; Cao and Cui, 2017) that provisions influence the effective corporate tax rate.

4. RESULTANTS AND ANALYSIS

4.1. DESCRIPTIVE STATISTICS AND CORRELATION MATRIX

Table 2 presents descriptive statistics for the variables used in the regression model. The effective tax rate for the

entire sample is 18.5% per cent .This rate is more than a quarter lower than the ordinary tax rate (25%). it is a first proof of tax avoidance among Tunisian companies. The average ROA is 9%. Tunisian companies are on average not very profitable. However, these companies are very heterogeneous. The minimum profitability is -205% and the maximum profitability is 383%. In terms of size, the Tunisian economic fabric is essentially made up of small and medium-sized enterprises. The table below shows that Tunisian companies are highly indebted: the average debt is 81.5% and can even reach 98.5%. Development research represents on average only 0.9% of total assets, while property, plant and equipment represent 53.4% of total assets. Tunisian companies give importance to tangible investment at the expense of research and development.

Table -2: Descriptive statistics

	Mean	Median	Std. Dev	Min	Max
GAAP ETR	0.185	0.210	0.146	0.000	1.000
ROA	0.090	0.018	2.154	-2.050	3.830
SIZE	12.833	10.510	1.510	1.973	22.663
LOSS	0.011	0.003	0.214	0.000	1.000
LEV	0.815	0.132	0.259	0.000	0.985
CAPIN	0.534	0.232	0.125	0.000	0.931
INVIN	0.236	0.089	0.116	0.000	0.637
RDIN	0.009	0.001	0.034	0.000	0.170
PROV	0.048	0.017	0.070	0.000	0.452

All variables are defined in Appendix-Table B

Using the Skewness/Kurtosis tests for normality of variables, it turns out that the variables in this research are not normally distributed, so Spearman's rank correlations are used.

Almost all the variables are significantly correlated. The highest correlations are between size and debt (0.364), between ROA and debt (0.380) and between GAAP ETR and ROA (-0,368). This result confirms previous studies which found that various measures of corporate tax evasion are highly correlated (see Table 3).

Table -3: Correlation matrix

	GAAP ETR	ROA	SIZE	LOSS	LEV	CAPIN	INVIN	RDIN	PROV
GAAP ETR	1								
ROA	-0.368***	1							
SIZE	0.149***	-0.273***	1						
LOSS	-0.042***	-0.248***	-0.114***	1					
LEV	0.075***	-0.380***	0.364***	0.007***	1				
CAPIN	0.004***	-0.175***	0.052***	-0.067**	0.177***	1			
INVIN	0.022***	0.007***	-0.082***	-0.010***	-0.040***	0.141***	1		
RDIN	-0.071***	0.242***	-0.176***	-0.023***	-0.191***	-0.027***	0.065***	1	
PROV	0.152***	-0.091***	0.237***	-0.065***	0.097***	0.126***	0.054***	0.138***	1

Notes :This table presents the correlations of Spearman's rank between the variables. All variables are defined in Appendix-Table B. ***. **. * indicate statistical significance at the 1%, 5% and 10% levels respectively.

Multicollinearity is checked by the variance inflation factor (VIF). The Table 4 presents the scores. All values are slightly above 1. These values are less than the critical value of ten. Values of ten or more are of interest (Field,2018). There is no reason to be concerned about multicollinearity. Then the model is robust because the factors are not influenced by correlation with other factors.

Table -4: Variance inflation factor analysis

	ROA	SIZE	LOSS	LEV	CAPIN	INVIN	RDIN	PROV
VIF	1.17	1.27	1.04	1.25	1.08	1.05	1.1	1.07

Notes :This table presents the correlations of Spearman's rank between the variables. All variables are defined in Appendix-Table B. ***. **. * indicate statistical significance at the 1%, 5% and 10% levels respectively.

4.2. PERFORMANCE AND TAX AVOIDANCE

Table 5 presents the results of the fixed-effects regression model. This study finds a negative (-0.016) and significant coefficient that reflects the relationship between ROA and

GAAP ETR. The negative coefficient indicates that a higher return on assets leads to a lower GAAP ETR and vice versa. Better performing companies have a lower GAAP ETR and therefore more tax avoidance. This indicates that if a company can demonstrate a high level of profitability, a reduction in the tax paid will be provided for. The most profitable companies will make more use of tax-exempt reinvestments to reduce the tax burden (Derashid and Zhang 2003; Rego 2003). This finding supports the theory of political power. The result also supports the null hypothesis (H0) that corporate performance is associated with tax avoidance.

Furthermore, the effective tax rate is influenced by other determinants. Size is positively and significantly associated with tax avoidance (0.002). This indicates that large industrial firms justify lower ETR than small ones. It is large quoted companies that use tax instruments to reduce the tax burden to a greater extent than small companies. This result is consistent with some other studies on tax avoidance (e.g. Delgado et al., 2014; Kraft, 2014; Jaafar and Thornton, 2015; Dyreng et al., 2016; Stamatopoulos et al., 2016). The estimated loss coefficient is positive (0.009) and significant. That means companies that made a loss in the previous year have a higher GAAP ETR. This result contradicts the findings of Lazăr (2014). With respect to leverage (LEV) the result shows a negative (-0.013) and significant effect on ETR . This result reinforces the view that debt financing of the company is recommended because of the deductibility of interest in corporate tax (Delgado et al., 2014). This study also finds that all variables are positive and significant in the case of asset composition. The literature gives different results for asset composition (for example Gupta and Newberry,1997; Lee and Swenson, 2008; Fernández-Rodríguez and Martínez-Arias, 2014; Jaafar and Thornton, 2015; Dyreng et al.,2016). In terms of provisions the regression result shows a positive and significant effect on ETR. This result confirms previous research (e.g. Zinn and Spengel, 2012; Lazăr, 2014; Cao and Cui, 2017). Deductible provisions are different when moving from accounting to taxation. The valuation of provisions is done in other ways (Zinn and Spengel, 2012).

Table -5: Fixed effects regression results model (1)

Intercept	ROA	SIZE	LOSS	LEV	CAPIN	INVIN	RDIN	PROV
0.218 ***	-0.016 ***	0.002 ***	0.009 ***	-0.013 ***	0.002 ***	0.039 ***	0.106 ***	0.159 ***
Adj. R^2	0.150							
F-statistic	102.000							
P-value	0.000							

Notes : The table shows the results of the fixed-effect regression of the ROA and control variables on GAAP ETR. All variables are defined in Appendix-Table B. ***. **. * indicate statistical significance at the 1%, 5% and 10% levels respectively.

4.3. QUADRATIC RELATION

The results found above seem to show that the relationship between ROA and GAAP ETR is not linear. The data for a possible quadratic relationship is examined. This paper therefore looks for a U or inverted U-shaped relationship between ROA and GAAP ETR (Haans et al., 2016). Using the following (fitted) regression model:

$$\text{GAAP ETR}_i = \alpha + \beta 1\ \text{ROA}_i + \beta 2\ (\text{ROA}_i)2 + \beta 3\ \text{SIZE}_i + \beta 4\ \text{LOSS}_i + \beta 5\ \text{LEV}_i + \beta 6\ \text{CAPIN}_i + \beta 7\ \text{INVIN}_i + \beta 8\ \text{RDIN}_i + \beta 9\ \text{PROV}_i + \varepsilon (2)$$

The same data and only add the ROA squared are retained for each observation. Table 6 gives the results of the fixed effects regression model (2).

Table -6: Fixed effects regression model (2)

Intercept	ROA	ROA^2	SIZE	LOSS	LEV	CAPIN	INVIN	RDIN	PROV
0.268 ***	-0.027 ***	0.000 ***	0.001 ***	0.003	-0.037 ***	0.004 *	0.042 ***	0.120 ***	0.155 ***
Adj. R^2	0.189								
F-statistic	114.180								
P-value	0.000								

Notes The table shows the results of the fixed-effect regression of the ROA and control variables on GAAP ETR. All variables are defined in Appendix-Table B. ***. **. * indicate statistical significance at the 1%, 5% and 10% levels respectively.

The coefficient of ROA2 is significant in model (2). This proves a priori the non-linearity of the relationship between the ROA and the GAAP ETR (Haans et al., 2016). This work uses the method of Lind and Mehlum (2010) to test this relationship. This method involves three steps. The first step is to examine the coefficient and significance of ROA2 (Lind and Mehlum, 2010). The coefficient is positive and the significance in model (2) indicates a U-shaped relationship. The second step is to examine whether the estimated endpoint is within the sample data field (Lind and Mehlum 2010). The estimated endpoint is 2.106 and is within the data field (see Table 7). The third step is to test whether the slopes are sufficiently steep and whether their signs are different for the two extremes of the data field (Lind and Mehlum, 2010). I test the slope at the lower and upper limit of the data field using Stata. Both are significant and the signs are opposite (see Table 7). The

relationship between ROA and GAAP ETR is U-shaped which the conclusion of the three steps is.

Table -7: U-shape test between ROA and GAAP ETR

	Lowest bound	Highest bound	Overall U-shape test
Interval ROA	-2.050	3.830	
Slope	-0.011	0.009	
T-statistic	-30.569	12.468	12.370
P-value	0.000	0.000	0.000

Notes : Method of the test by Lind and Mehlum (2010). The test is based on the data field of ROA and the relation between ROA and GAAP ETR.

The R2 in model (2) is higher than in model (1) and the ROA coefficient is more negative (-0.026) compared to model (1). This result confirms that corporate performance has a negative effect on tax avoidance. The sign of the other variables does not change. Only LOSS is not significant in model (2).

5. CONCLUSION

The central question of this study is whether corporate performance influences tax avoidance. First the results of the study are briefly presented. Next the limitations of this study are discussed. Finally some ideas for further research and the contribution of this work to the literature and policy-makers will be presented.

The literature is inconclusive on the relationship between corporate performance and tax avoidance. Previous studies on the determinants of the effective tax rate have produced different ROA results. This study is concerned with the possible relationship and the sign of that relationship. Two theories support a possible relationship between ROA and tax avoidance: The political cost theory and the political power theory. The political cost theory suggests that as firms' performance increases, they engage less in tax avoidance and vice versa. Indeed, on the one hand, the firms with the highest profits are more visible to the government. On the other hand, companies with poorer performance need to avoid taxes. On the contrary, the theory of political power suggests that the better the performance of the firm, the more it engages in tax avoidance maneuvers due to the availability of resources, to influence the political process or to hire tax experts... The theory of political power suggests that the better the performance of the firm, the more it engages in tax avoidance maneuvers due to the availability of resources, to influence the political process or to hire tax experts...

The regression results show that the estimated regression coefficient of the GAAP ETR regression on ROA is negative and significant. This result confirms the H0 conclusion that corporate performance is associated with tax avoidance. This result is consistent with the theory of political power. Better company performance leads to an increase in tax avoidance.

This paper introduces a square term into the model as part of the quadratic relationship and the result shows a U-shaped relationship between firm performance and tax avoidance.

This article has limitations. The first limitation is the consequence of the limitations of the tax avoidance measure. GAAP ETR does not reflect strategies that allow tax deferral (Hanlon and Heitzman, 2010). Therefore, the elimination of business years with negative pre-tax income also has disadvantages. This study excludes companies with negative returns on assets. The second limitation is the sample size. In the process of selecting the sample a lot of data is lost. On the one hand, the sample selection procedure is necessary to avoid distortion, but a larger sample makes the results more robust. The third limitation is that this study does not consider whether different industries have an effect on the relationship between ROA and GAAP ETR.

Further research can focus on the possible quadratic relationship between corporate performance and tax avoidance in Tunisia. It is interesting to test this quadratic relationship also in other parts or countries of the world. It is also recommended to consider the effects on industry. It is important for policy makers to know which sectors practices tax avoidance the most.

The contribution of this work is obvious to the literature and to policy makers. First, ROA is an important determinant of ETR GAAP . But there is no study of the relationship between ROA and GAAP ETR in the Tunisian context. This article is the pioneer in studying this relationship.

Secondly, this work shows that the more efficient the company is, the more it evades taxes. This implies that policy-makers can combat tax evasion by keeping a closer eye on the best performing companies.

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Appendix

Table A: Overview literature about relation between ROA and tax avoidance

Research	Sign independent variable ROA	Significance level	Research country	Dependent variable	Other control variables
Panel A: Studies that confirm Political cost theory					
Armstrong et al. (2012)	+	GAAP ETR *** Cash ETR **	USA and S&P 500	GAAP ETR & Cash ETR	Managerial incentives, market capitalization, leverage, change in goodwill, new investment, foreign assets, geographic and industry complexity, tax fees
Delgado et al, (2014)	+	***	EU (15 countries)	Current ETR	Company size, leverage, capital intensity, inventory intensity, statutory tax rate
Gupta and Newberry (1997)	+	**	USA	Current world wide income tax expense/EBIT & Current world wide income tax expense/ operating CF before interest and taxes	Firm size, leverage, asset mix
Jaafar and Thornton (2015)	+	***	EU (14 countries)	Current ETR & Current tax expense/cash flow from operations	Tax haven, size, leverage, capital intensity, inventory intensity, statutory tax rate
Omri and El Aissi (2012)	+	***	Tunisia (39 Tunisian listed firms from 2001 to 2006)	Pretax book income less taxable income for firm j in year t less deferred tax expense / tax rate,	Size of the firm ,Sector of activity , Ownership structure ,Organisational structure , Age of the firm
Panel B: Studies that confirm Political power theory					
Cao and Cui (2017)	-	***	China	Total tax expense minus deferred tax expense/profit before tax & Total tax expense minus deferred tax expense/profit before interest and tax & Total tax expense minus deferred tax expense/pre-tax profit minus deferred tax expense scaled by statutory tax rate	Size, leverage and capital intensity
Huang et al, (2013)	-	***	China	Current ETR	Size, leverage, innovation intensity, labour intensity, measures which holds the shares (other firms or government), tax reform, high-tech industry or not
Kraft (2014)	-	***	Germany	GAAP ETR	Size, leverage, operating lease expense, free cash flow, foreign sales, growth and mature

Panel C: ***Inconclusive Empirical Research***					
Fernández-Rodríguez and Martínez-Arias (2014)	Brazil + Russia – India – China +	Brazil ** Russia *** India China ***	Brazil, Russia, India and China	Current ETR	Size, leverage, capital intensity, inventory intensity, year and industry
Dyreng et al, (2016)	Mixed results		United Kingdom	GAAP ETR	Size, leverage, intangibles, inventory intensity, R&D intensity, capital intensity, capital expenditures, firm use tax havens or not, year and firm fixed effects
Janssen (2005)	ETR 1^{J} – ETR 2^{J} +	ETR 1^{J} ETR 2^{J} **	Netherlands	(tax expense-(deferred tax provision$_t$ – deferred tax provision$_{t-1}$)/EBIT (ETR1^{J}) & (tax expense-(deferred tax provision$_t$ – deferred tax provision$_{t-1}$)/(Cash flow – (EBIT-earnings before interest)) (ETR2^{J})	Size, capital intensity, international activities, leverage, company is public or listed
Bao and Romeo (2013)	+ for the largest 5 percent of firms	**	USA and S&P 500	effective tax rate	Size, capital intensity, leverage
Wu et al, (2012a)	+ for privately-owned firms, -for state-controlled firms	***	PT-NGC PT-GC sample NPT-NGC NPT-GC	effective tax rate	Size, lev, capint,, invint, growth
Holland, K, 1998	-for 4 years (1978-1981)	***	data was drawn from the period 1968, the start of the Datastream records to 1993, The sample was based on the largest 350 companies in each year	effective tax rate	The ratio of trading stock to total assets
Omri and El Aissi (2010)	-		Tunisia (19 Tunisian listed firms from 1998 to 2006)	Tax management of results as measured by Current Discretionary Accruals.	Size, Industry Sector, Debt Ratio, Ownership Concentration, Managerial Ownership Opening of more than 30% of the capital
Safa et al.(2017)	+ + -	** *** ***	55 Tunisian listed companies from 2008 to 2013	effective tax rate (ETR) cash flow effective tax rate (CFETR). Book-Tax Difference (BTD)	firm size, Levrage, market to book, Tunisian revolution

Omri et Bouaziz(2013)	+		39 companies, 24 of which are listed on the Tunis Stock Exchange.	Discretionary differences between the accounting result and the tax result.	commercial fund, tangible investments, revenue growth

The table provides an overview of recent studies on the determinants of tax evasion. This table does not include all available studies due to the range.The most important and most recent studies are listed, in particular those whose country of research is Tunisia, as my study focuses on Tunisia. In all studies, ROA is a control variable. The second column gives the sign of the relationship between ROA and the tax avoidance measure. The third column contains the research country(ies).The fourth column presents the tax avoidance measure used in the study. The fifth column gives the other variables in the study's regression model. ***, **, * indicates statistical significance at the 1%, 5% and 10% levels, respectively.

Table B: Variable definitions

Dependent variable	
GAAP ETR	Total worldwide tax expense divided by total worldwide accounting income before tax
Variable of interest	
ROA	Net income divided by total assets
Control variables	
SIZE	Natural logarithm of total assets
LOSS	dummy variable equal to 1 if the company had a net operating loss in the previous year and 0 otherwise
LEV	Long-term debt divided by total assets
CAPIN	Tangible fixed assets divided by total assets
INVIN	Inventory value divided by total assets
RDIN	R&D expenditure divided by total assets
PROV	Provisions divided by total assets