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Environmental Social Governance and the Determinants of Effective Tax Rate: Evidence from France

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Abstract

The performance of a company in terms of environmental, social and corporate governance factors has gained relevance in different areas related to corporate background, as financial performance, market value and tax avoidance. Additionally, effective tax burden continues to be a frequently mentioned subject in tax policy debates. The focus of this dissertation is the analysis of the main determinants of the effective tax rate (ETR), namely the relationship between Environmental Social Governance (ESG) and ETR. The main objectives of this research are, to test if the ESG reputation level influences companies' ETR and to understand the other main factors that significantly explain the ETR variability. This analysis includes two alternative ETR measures. The sample consist in 359 French listed firms with data from 2016 to 2018. The regression models are estimated through a Generalized Least Squares (GLS) estimator with cross-section weights and cross-section fixed effects. The results indicate that firm ESG reputation is a significant explanatory factor of the ETR. For both models, the results show that firm size and profitability have a negative relationship with ETR. On the contrary, inventory intensity has a positive relationship. Consequently, the firms with higher dimension, higher profitability levels and lower inventory intensity, face lower ETR. Contrary to expectations, debt is not preferably used to reduce tax burden and R&D expense is not statistically significant. This investigation is relevant because it provides evidence of the impact of a new dimension, the ESG reputation, on the variability of ETR.

Keywords: Determinants of Effective Tax Rate | Environmental Social Governance

Resumo

A performance ambiental, social e de administração de uma empresa tem ganho bastante relevância em diversas dimensões do contexto empresarial, tais como, na performance financeira, no valor de mercado da empresa e na evasão fiscal. Por outro lado, a taxa efetiva de imposto continua a ser um tema frequentemente analisado no debate de políticas fiscais. O tema desta dissertação está relacionado com a análise dos principais determinantes da taxa efetiva de imposto (ETR), em particular com a relação entre a dimensão Environmental Social Governance (ESG) e a ETR. Os principais objetivos deste trabalho de investigação são testar se o nível de reputação ESG das empresas influencia a ETR imposta a estas empresas e analisar outros fatores que explicam significativamente a variabilidade da ETR. Nesta análise introduzimos duas medidas alternativas de ETR. A amostra consiste num conjunto de 359 empresas cotadas francesas, com dados relativos aos anos entre 2016 e 2018. Os modelos de regressão são estimados através de Generalized Least Squares (GLS) com cross-section weights e cross-section fixed effects. Os resultados indicam que a reputação ESG da empresa é um fator explicativo significativo da ETR. Para ambos os modelos, os resultados mostram que a dimensão e a lucratividade da empresa apresentam uma relação negativa com ETR. Pelo contrário, a intensidade de inventário tem uma relação positiva. Consequentemente, as empresas com níveis mais altos de dimensão e lucratividade e com menor intensidade de inventário, registam menor ETR. Contrariamente às expectativas, a dívida não é preferencialmente usada para reduzir a carga tributária e as despesas de I&D não são estatisticamente significativas.Esta investigação é relevante porque fornece evidências do impacto de uma nova dimensão, a reputação ESG, na variabilidade da ETR.

Palavras-chave: Determinantes da Taxa Efetiva de Imposto | Environmental Social Governance

Contents

List of Tables

Chapter 1

Introduction

The focus of this dissertation is the analysis of the main determinants of the effective tax rate (ETR), namely the association between Environmental Social Governance (ESG) and ETR. This research aims in particular to test if the ESG reputation of a firm is a significant explanatory factor of ETR.

ESG can be defined as the environmental, social and corporate governance performance of a company. In the last years, the firm social responsibility has gained relevance and it has been associated with various areas related to corporate issues, such as, financial performance, market value and tax avoidance. The effective tax rate is the real tax burden borne by companies. According to Gupta and Newberry [1997], tax policy debates frequently mentione ETR because it is a measure that can conveniently summarize the cumulative effect of various tax incentives in one statistics.

The relationship between these two dimensions, social responsibility and ETR has recently started to be more studied, namely in the context of tax avoidance. According to Lanis and Richardson [2012], Zeng [2013] and Laguir et al. [2015], companies with higher corporate social responsibility (CSR) ranking have higher ETR. However, studies that specifically address ESG ranking and its relationship with ETR are still quite scarce. For that reason the main contribution of this dissertation is the provision of evidence of the impact of a new dimension, the ESG reputation, on the variability of ETR. This investigation seems important, since ESG is becoming more relevant. In fact, prior literature has confirmed that the ESG firm conduct has reputational, compliance and financial impact on firms. Therefore, we intent to understand if the ESG reputation is related to ETR, in order to verify if ESG has an impact on a wider range of areas, such as taxation. The ESG field is particularly interesting for investors and companies. In fact, recently, researchers as Schoenmaker and Schramade [2019], argue that traditional finance, based on efficient markets hypothesis, portfolio theory and the separation between finance and societal concerns is far from maximising long-term value, since it does not include social and environmental dimensions on risk and performance measures. Regarding companies, in a transition to a more sustainable economic model, the long-term value creation

includes not only financial value maximisation for shareholders but also incorporates the creation of social and environmental value in the long term [Dyllick and Muff, 2016]. In this sense, the lack of not only social responsibility, but also corporate income tax responsibility (held by aggressive tax planning, for example) may also generate corporate governance risk, damage firm reputation and finally deteriorate the long-term interests and value of the company. Additionally, worse performance on ESG indicators can deteriorate the relationship between these companies and country governments.

At the same time, studying the determinants of ETR is relevant, for both micro and macroeconomic levels, because it helps identify additional aspects that influence taxation systems. Regarding firms' perspectives, the analysis of the factors that explain the ETR variability might be seen as an essential element for firm's fiscal strategy and potentially contribute to tax savings, which is in line with the main purpose of a firm: the creation of value. From a policymaker point of view, ETR is also a detection tool of tax avoidance (the reduction of tax payments through legal tax planning methods). In fact, [Mills et al., 1998, Rego, 2003] consider it a measure of the efficiency of tax planning. Additionally, as, in research, ETR can be computed with financial information that is disclosed on firms' financial statements, the international comparison of this measure is facilitated. In fact, the use of ETR to measure the competitiveness of tax jurisdictions from different countries provides a more accurate representation of the corporate tax systems' effects on the actual tax liabilities of companies than nominal tax rate (Corporate Tax Statistics 2019 -OECD). The investigations of Vandenbussche et al. [2005], Crabbé [2006] and Rekik and Ali Omri [2009] found the existence of tax competitiveness between regions and countries.

In this sense, the objectives of this research work are to test if the ESG reputation level influences companies' ETR and to understand the other main factors that significantly explain the ETR variability. To achieve these goals, we use a panel data set and a Generalized Least Squares (GLS) estimator. This thesis particularly focuses on the ETR determinants of the French listed firms, during the period between 2016 and 2018. The main reference for this dissertation is the Gupta and Newberry [1997] study, namely for the variables typically used in ETR determinants investigation. This regression analysis includes two alternative ETR measures.

The empirical results show that firm ESG reputation is a significant explanatory factor of ETR. For ETR1, the results show that firms with worse ESG reputation rating face lower ETR, but, for ETR2, firms face higher ETR. Therefore, the evidence is not clear if the association between the two variables is positive or negative. For both models, the results show that firm size and profitability have a negative relationship with ETR. On the contrary, inventory intensity has a positive relationship. Consequently, the firms with higher dimension, higher profitability levels and lower inventory intensity, face lower ETR. Contrary to expectations, debt is not preferably used to reduce tax burden and R&D expense is not statistically significant. Regarding capital intensity, a positive association

is registered for ETR1. However, this variable is not statistically significant for ETR2. Robustness checks are performed, in order to achieve a more complete analysis. Firstly, we re-estimate the model only with firms with higher levels of capital intensity. Additionally, we introduce the variable short-term leverage in the model. The results reinforce the insights initially obtained.

This dissertation contributes to the existing literature in several ways. Firstly, it expands the literature on the determinants of effective tax rates by including a new dimension in the analysis, the Environmental Social Governance. Secondly, it provides evidence on how company characteristics can determine ETRs, namely, how financial and investment decisions of French listed firms influence their real tax liability. Finally, it gives valuable information for policymakers and regulators about the tax systems, namely about the factors that may influence the corporate tax burden paid.

This paper is structured as follows: Chapter 2 reviews the prior literature on effective tax rate and social responsibility and describes the investigation hypothesis; Chapter 3 is dedicated to France, the French tax system and ESG rules; Chapter 4 presents the variables and describes the methodological approach, the regression models and the sample; Chapter 5 provides the univariate and multivariate results and a complementary analysis; Chapter 6 presents a conclusion of the study.

Chapter 2

Literature Review and Research Hypothesis

This chapter explores the main concepts of this investigation (Social Responsibility and ETR), reviews the prior literature related to two dimensions, and defines the investigation hypothesis. The chapter is organized as follows. First, a literature review focus on social responsibility and ETR, separately. Second, an explanation of the relationship between these two dimensions. Finally, there's a presentation of the association of ETR and firms' financing and investment decisions, such as size, leverage, asset mix and profitability. The investment decisions are mainly related to the asset structure, as capital intensity, inventory intensity and R&D intensity.

Social Responsibility

The social responsibility of a firm has been associated to many areas related to corporate issues, such as financial performance, market value and tax avoidance. In the last years, the study of the relationship between corporate social responsibility activities and others dimensions has been done using Corporate Social Responsibility (CSR) indicators. This concept consists in firm actions and policies that go beyond minimum legal requirements and obligations in order to address societal needs and meet stakeholders' expectations [Freedman, 2006, Aguinis, 2011]. The stakeholders are a diverse group that includes workers, suppliers, shareholders, consumers, governments and communities with economic, social and environmental concerns.

More recently, a new notion has gained greater relevance, both in research and in the business domain. It is the Environmental Social Governance (ESG), which consists in the environmental, social and corporate governance performance that results from the corporate decision-making [Zhao et al., 2018, UNEP FI and Mercer, 2007]. In particular, ESG pays attention to how companies take actions to promote environmental protection, how they treat their workers (human rights and employment conditions) and how they

relate to its stakeholders (supply-chain). Additionally, it also includes issues related to corporate governance, such as corruption, fraud and anti-competitive practices.

In order to evaluate a company's ESG, several firms, as *Sustainalytics, RepRisk, Refinitiv* and *MSCI* have been dedicated to the creation of methodologies to calculate index and ratings based on multi-indicator assessments and on processing large amounts of data.

For being such a broad and detailed measure, ESG has also been seen as an investment assessment measure. Since, ESG can provide insights on many different types of risks, some investors believe that having information about companies' ESG strategies and ESG ratings, allows a better understanding of risks of the firms in which they are investing. Therefore, ESG is a useful tool in investment decision-making processes. For example, according to US SIF Foundation's Report on US Sustainable, Responsible and Impact Investing Trends, in the current USA investment market, practically 25% of investment is related to ESG firms and it registered a growth of 38% between 2016 and 2018.

Firms and the society in general are more aware of ESG, partly because of growing numbers of institutions focused on ESG and the growing diffusion of international principles that establish the promotion of transparency, ethical and environmental protection. In 2003, the UNEP FI AMWG (United Nations Environment Programme Finance Initiative Asset Management Working Group) was founded in order to understand how ESG factors can affect investment value and promote their integration into the investment process. In a similar way, in Europe, the EFFAS CESG (European Federation of Financial Analysts Commission on ESG Environmental, Social & Governance) was created in 2007. Additionally, the 10 Principles of the UN Global Impact and the Principles for Responsible Investment (launched in 2006), both supported by the United-Nations, highlight the importance of ESG concerns on the creation of value on long-term.

Futhermore, research is expanding on this field too. Taliento et al. [2019] test if there is a positive correlation between financial-market performance of firm and ESG performance. Although, in general, the ESG impact was considered irrelevant, researchers point out the relative relevance of ESG performance of a firm, when compared to other companies' performance in the industry. In fact, according to Taliento et al. [2019]), in today's modern times, environmental, social and governance responsibilities can be viewed as a competitive factor of a company due to the reputation, confidence and stability transpired. This idea supports the opinion of Porter and Van Der Linde [1995] on how ESG actions make a distinction in the firm's competitive position. On the other hand, Huang [2019] executes a meta-analysis by combining and reviewing the results obtain from several prior studies related to the relationship between ESG performance and corporate financial performance (CFP). By considering 21 different papers, this investigation intends to understand what motivates companies to undertake ESG actions, voluntarily. Consistent with theoretical expectations, the empirical evidence shows a positive, statistically significant but economically modest association between ESG performance and CFP. This

review also highlights that the interest in ESG is extensive and increasing. Moreover, Zhao et al. [2018] studies the listed firms from the Chinese energy power market, in order to compute their ESG performance and to understand its relationship with the financial performance. The evidence obtained show that higher ESG performance levels may indeed enhance financial performance.

Effective Tax Rate

The effective corporate tax rate (ETR) consists of the measure for assessing the real tax burden. For that reason, ETR tends to differ from nominal tax rate stablished by law (the statutory tax rate). The differences between accounting and fiscal rules are the main explanation for this gap. These potential fiscal corrections result in a taxable profit that is different from the accounting profit. According to Široký et al. [2017] the nominal-effective tax rate deviation is a consequence of the differences in methods used for depreciation, inventory evaluation and loss compensation. The author also highlights the impact of investment incentives and differences in the deductibility rules of costs. Also, Crabbé [2006] explains that the differences between ETRs are due to the tax rules variety and complexity, the existence of special tax regimes and tax incentives.

ETR can be calculated in several ways. The differences are based on the aggregation level of the data and on the time orientation of the methods [Vandenbussche et al., 2005]. Nicodème [2002] clarify the three widespread methodologies existent on economic literature that can be used to compute corporate ETR, based on the type of information selected. First, the macro backward looking approach is based on aggregated data to generate macroeconomic ratios of corporate tax burdens. Second, the micro forward-looking approach focuses on firm's information and theoretically allows the inclusion of elements of tax differentiation. Due to its micro perspective, it's possible to do an in-depth analysis of specific sectors or of specific characteristics of firms. However, if this approach includes all the elements of the tax system, it will result in excessively complicated models. Thirdly, the micro backward looking approach also uses financial accounts of firms and features of the tax system. It is related to the subject of differences in effective taxation for different kinds of firms. It's also important to note that a forward-looking approach is based on a hypothetical analysis and that a backward-looking approach evaluates the decisions of the company in the past, by using real ex-post data.

In terms of ETR evolution, for the period 1998 to 2013, Dyreng et al. [2017], Široký et al. [2017], S. Markle and A. Shackelford [2011], registered a relevant reduction on ETR, respectively in USA, Europe and in a more worldwide framework. Nevertheless, several studies had confirmed that ETRs vary across firms and across countries. This reality has motivated an increase in the investigation of the reasons of this diversity and this variability. To better understand ETR, empirical research focuses on the firm characteristics and tests if they are significant influencial factors. The study of Delgado et al. [2014] concludes

that in literature there is more or less agreement that size, debt, asset mix, and profitability are the main explanatory variables of ETR. In order to define the research hypothesis of this dissertation, a literature review focused on each of the variables is explained below.

Futhermore, the expansion of the ETR literature has occured through the introduction of new dimensions in this study field, such as audit quality, ownership and corporate governance. For example, Janssen and K. Crabbé [2005] and Crabbé [2010] conclude that hiring a Big 4 auditor has a significant impact on the reduction of ETR. On the other hand, Rodriguez et al. (2019) results reveal that private firms have higher ETRs than state-owned companies. Besides, Janssen and Buijink [2000] show that the Dutch corporate income tax system is fairly neutral, in a way that the tax payer either a public firm or a listed firm does not affect the firm's ETR.

In terms of countries, the debate about ETR seems to be a topic with global relevance due to the variety of countries already investigated.

2.1 Environmental Social Governance and ETR

The relationship between these two dimensions, social responsibility and ETR has recently started to be more studied, namely in the context of tax avoidance.

In fact, Zeng [2013] studies the association between CSR firm ranking, company tax aggressiveness and market value. By analysing the data from the financial statements of Canadian public firms and venture capital, from 2005 to 2009, it was possible to identify a positive relationship between CSR ranking and firm market value, and a negative relationship between CSR ranking and annual ETR. These results suggest that companies with higher CSR ranking will improve their market value, due to this better reputation. The findings also reveal that higher ranked firms, in terms of CRS, have less propensity to be tax aggressive. This research work praises the relevance of firm reputation. In line with the previous papers, the investigation of Lanis and Richardson [2012] also studies how CSR is related to tax aggressiveness of firms. This paper analyses a group of listed Australian firms during 2008 and 2009 and takes in consideration the level of CSR information disclosed as a proxy for CSR performance. The dependent variable is ETR, a proxy to corporate tax aggressiveness (TAG) into consideration. The results show a negative association between CSR and TAG. This means that firms with a higher level of CSR activities have lower levels of tax aggressiveness, i.e. the ETR faced by firms is higher. In addition, Laguir et al. [2015] examines the effect of different dimensions of corporate social responsibility on tax aggressiveness, in the French context. By using a set of CSR rating indicators, the authors conclude that the higher the scores in social dimensions, the lower the likelihood of tax aggressiveness. However, results reveal no significant relationship between TAG and environmental or governance dimensions.

Considering the idea that the ESG conduct may have some reputational, compliance and financial impact on the firm, this dissertation proposes to test if there is also some impact in terms of taxation. In line with Freedman(2006), Lanis and Richardson [2012] suggest that, since there is pressure on companies to pay their 'fair share' of tax, corporate tax aggressiveness should be considered a socially irresponsible activity that affects society. And therefore, be reflected in social responsibility ranking. This way, it may be expected that companies with worse ESG reputation face lower ETR, since their bad ESG performance may be, in part, explained by irresponsible tax actions.

Then, taking the ascending importance of ESG and the prior literature into account, it seems reasonable the inclusion of this field on this ETR analysis. However, the study focus is not directly connected to tax avoidance. Therefore, this dissertation intends to understand if the ESG reputation level influences the ETR level of firms.

H1. *ETR is related to ESG reputation.*

2.2 Size of firm and ETR

Size is a variable that represents the dimension of the company and it's one of the main factors used on ETR investigations. In the literature, its relationship with variability of ETR is explained through two opposite and competing lines of justification. The first view is based on a political cost theory and defends that when firms are larger and more prosperous, they are better known and as consequence this visibility makes them more subject to regulatory and control intervention by government. Therefore, this hypothesis suggests that ETR tends to be higher for larger firms. A positive relationship between ETR and company size is thus expected. This theory is defended by Zimmerman et al. [1983] who, through a univariate analysis, investigate the relation between ETR and the dimension of firms. This investigation found evidence that larger firms tend to face higher ETR, in the USA. Therefore the results support the political cost theory. The empirical evidence of Kraft [2014] and Aksoy Hazir [2019] supports this perspective.

On the contrary, the second argument predicts an inverse association. Based on the political power theory, a negative relationship between ETRs and company dimension is expected, because larger firms are more prepared to take tax planning procedures, to reach the optimal level of tax savings, and to make political lobbying actions, in order to influence the political process in their favour. This argument is built on the idea that this type of firms has more resources available. Porcano [1986] finds evidence of this in a negative association between firm size and ETR. In this research work, Porcano also concludes that the Corporate Income Tax (CIT) in the USA is regressive and that a reform on CIT is needed in order to raise tax revenues and promote a more equitable tax system. The investigation works of Kim and Limpaphayom [1998], Derashid and Zhang [2003] and Richardson and Lanis [2007] are in line with this second hypothesis that bigger firms are expected to be submitted to lower ETRs.

Given these conflicting conclusions, Wilkie and Limberg [1990] reanalyze the investigations of Zimmerman and Porcano and highlight their main differences. This revision work concludes that the opposite results are explained by the use of different methodological procedures in their empirical analysis. The main differences are related to the definition of ETR and Size, the sample selection procedures and the data aggregation method.

Additionally, different results, regarding the ETR-size relationship, can as well be explained through dissimilarities between countries. For example, Fernández-Rodríguez and Martínez-Arias [2014] investigation that contribute to a better understanding of the effective tax rate of BRIC countries (a set of emerging economies, Brazil, Russia, India, and China), shows that explanatory variables, as size, differ from country to country. In fact, in terms of size, there is a significant and positive relationship with ETR in Brazil and China, and a negative one in Russia. This variable is not considered relevant in India.

Notwithstanding, other authors highlight an inconclusive relationship between size and ETRs, such as Stickney and Mcgee [1982] and Gupta and Newberry [1997]. Furthermore, Delgado et al. [2018] tests the political power theory versus the political cost theory by analyzing the association between ETR and Size in Germany. Other variables such as leverage, capital and inventory intensity and profitability are included. The main contribution of this paper is in terms of the econometric methodology used. Instead of using linear regressions, this work is based on a conditional quantile regression approach, in order to test non-linear relations between the variables and ETR. In terms of size, the results show a nonlinear relation, with positive and negative signs depending on the quantiles examined.

In 2019, a report from *Observatoire des Multinationales* analyzed the biggest listed firms in France (CAC40) and concluded that, despite the larger size of these companies, they succeeded in reducing the tax rates faced, specially through fiscal planning. This report also highlights the larger expenses of these companies in lobbying activities [Observatoire des Multinationales, 2019].

Considering the fact that our sample only includes listed firms, this thesis intends to test if:

H2. *The political power theory is verified.*

2.3 Leverage and ETR

Stickney and Mcgee [1982] and Gupta and Newberry [1997] contribute to the literature, overcoming the limitations of Zimmernan and Porcano's univariate analysis by developing a multivariate analysis. Besides the ETR-size relation, other firms' characteristics are included, as leverage.

The theory of finance explains that in the definition of their capital structure, companies can choose between equity or debt financing. This decision may be influenced by the different fiscal treatment of each of these financing choices. In fact, according to Gupta and Newberry [1997], ETRs may be affected by firm's financing decision when tax system establishes differential treatment for debt. The possibility to deduct interest expenses on the taxable profit makes firms rethink their capital structure decisions in order to influence the ETR. This view that the existence of tax deductibility for debt allows an increase on the value of the company in proportion to the amount of debt used and a reduction on the taxable profits was previous defended by Modigliani and Miller [1963].

The financial leverage captures the firms' financing decisions and it's a proxy for companies' capital structure. Stickney and Mcgee [1982], Gupta and Newberry [1997], Richardson and Lanis [2007],Kraft [2014] and Aksoy Hazir [2019] are some of the researchers that discovered a negative association between Leverage and ETRs, by confirming that more leveraged companies revealed lower ETR. Those results are in agreement with the classical discussion. On the contrary, Feeny et al. [2005] finds a positive association between leverage and ETR, on Australian firms. The author identifies as justification, the possibility that Australian limitation on the tax deduction of interest expenses is not sufficient to encourage the increase in leverage, theoretically predicted. This positive relationship was also detected on the investigation of Crabbé [2006] and Chen et al. [2010].

As the French tax system also benefits debt (PWC- Worldwide Tax Summaries 2019), we expect a negative association between Leverage and ETR, as expressed on the following hypothesis:

H3. *Leverage is inversely related to ETR.*

2.4 Asset Mix and ETR

The Asset Composition, also designated as Asset Mix, can have an impact on the ETR imposed to firms [Gupta and Newberry, 1997, Delgado et al., 2014]. The inclusion of this variable allows to capture firms' investment decisions. Frequently, Capital Intensity, Inventory Intensity and R&D Intensity are the asset structure variables used.

2.4.1 Capital Intensity

Concerning capital intensity, the main condition that may influence the effective tax burden is the tax treatment of depreciations and amortizations. Accounting rules predict the existence of annual depreciations and amortizations costs related to fixed assets (IAS 16 - property, plant and equipment). These expenses are deductible in most tax systems. In fact, tax rules usually allow companies to subtract the cost of depreciable assets over periods shorter than their economic lives [Richardson and Lanis, 2007]. Therefore, firms that are more capital intensive, i.e. companies that have a higher proportion of fixed assets (depreciable non-current assets), tend to have higher depreciations costs and therefore benefit from a lower ETR, due to tax incentives. Supporting this point of view we can identify the studies of Stickney and Mcgee [1982], Gupta and Newberry [1997], Vandenbussche et al. [2005] and Richardson and Lanis [2007] that found empirical evidence of a negative association between the proportion of tangible assets and ETR. In the case of Fernández-Rodríguez and Martínez-Arias [2014], both positive and negative associations were registered, depending on the country analyzed. According to Delgado et al. [2012] Delgado et al. [2012], only after reaching a certain level of capital intensity, firms can reduce their tax burden. It's also important to point out that other studies didn't find statistical significant association between ETR and Capital Intensity [Harris and Feeny, 2003, Rodríguez, 2004, Liu and Cao, 2007].

Nevertheless, we are going to test this potential negative impact on ETRs:

H4. *Capital Intensity is inversely related to ETR.*

2.4.2 Inventory Intensity

Inventory intensity consists in the proportion of inventory on total assets of a firm (volume of current assets). It's considered a capital intensity substitute, if we see inventory investment as an alternative application of funds to fixed assets. As a result, there are limitations to the possibility of decreasing the ETR when the proportion of inventory is relatively higher[Fernández-Rodríguez and Martínez-Arias, 2014]. For that reason, a positive association is expected between inventory intensity and ETR.

Zimmerman et al. [1983], Gupta and Newberry [1997] and Richardson and Lanis [2007] concluded that when the company's proportion of inventory is greater, firms have higher ETRs. On the other hand, the results of Derashid and Zhang [2003] show that the coefficient of inventory intensity is not statistically significant.

In line with previous empirical tests about inventory intensive companies our hypothesis is:

H5. *Inventory Intensity has a positive relation with ETR.*

2.4.3 R&D Intensity

According to Gupta and Newberry [1997], Research and Development (R&D) expenses are other factors responsible for investment-tax shield. These expenses just permit to obtain gains from R&D on the long run but typically they can be immediately deductible.

It may be considered another relevant element associated to firms' investment decisions that contributes to lower ETR. This negative association is justified by the wide existence of tax incentives, in many jurisdictions, created to promote R&D investments. In concordance with this perspective, it's possible to identify the following studies Gupta and Newberry [1997], Crabbé [2006] and Richardson and Lanis [2007].

As, France gives fiscal support to R&D expenses of firms through a volume-based tax credit (Crédit d'Impôt Recherche – CIR), a negative relationship between R&D Intensity and ETR is expected. Among OECD members, France is the second government that gives more support to business R&D as a percentage of GDP. Since 2008 that this support has increased with a notable augmentation of tax incentives for R&D - OECD [2019b].

In this sense, we intend to test if:

H6. *R&D Intensity is inversely related to ETR.*

2.5 Profitability and ETR

Profitability is another firm characteristic frequently used on ETR investigation. Profitable companies tend to face higher tax rates because they disclose higher earnings. In line with this view a positive relation between profitability and ETRs is expected. Gupta and Newberry [1997] and Minnick and Noga [2010] found empirical evidence that support this positive association.

However, the opposite may also occur. Indeed, profitable companies can reduce ETR through tax incentives or tax exemptions. For example, studies concerning Malaysia typically find evidence of a negative relation. According to Derashid and Zhang [2003] this result is justified by the industrial policy in Malaysia that gives a tax subsidy to the most efficient firms. According to Manzon, Jr. and Plesko [2001], more profitable firms have more opportunities than less profitable companies to make more efficient use of tax deductions, credits and exemptions. In fact, profitable companies have more available resources for turning to tax planning strategies that permit ETR reductions. The greater pre-tax income of profitable companies is what incentives them to engage in tax planning [Rego, 2003]. Also Kraft [2014] agreed with this perspective. Once more, Fernández-Rodríguez and Martínez-Arias [2014] found opposite associations between ETR and profitability, in their BRIC countries analysis.

Bearing in mind the existence of these two contrasting hypothesis, described above, we do not define an expected sign for the association between this feature and ETR. Therefore, the hypothesis is:

H7. *ETR is related to the Profitability of firms.*

Chapter 3

France, the French Corporate Tax System and ESG rules

The choice of this country is justified by the fact that France is Europe's third largest national economy, representing almost 15% of EU's GDP, in 2017 (Eurostat Data Explorer). In addition, according to the OECD Corporate Tax Statistics Report [OECD, 2019a], it's the 6th G20 State with the highest Effective Average Tax Rate (EATR). This report also revealed that France is one of the European countries that give most fiscal support to R&D expenditures of firms.

According to the *Direction Générale des Finances Publiques*, the French corporate income tax (CIT) had a standard rate of 33,3%, during the period 2010 to 2017 [Tax Policy Directorate, 2016]. A slight reduction was recorded in 2018, with the nominal tax rate falling to 33%. This downward trend continued in 2019, with the reduction of the nominal tax rate to 31% . Therefore, for the period of analysis of this dissertation, the French nominal tax rate remained practically constant.

France is also a relevant player in terms of social responsibility and corporate sustainability. In fact, the implementation of the Article 173, in 2015, has reinforced the obligation of disclosure about how environmental, social and governance (ESG) factors are included in the strategy and decision process of companies.

In particular, Article 173-IV focuses on the recognition of the social and environmental consequences of firm activity. In turn, Article 173-VI requires asset management firms and institutional investors to share information about ESG factors integration methods in investments decisions. This law aims to contribute to energy and ecological transition *(Transition Énergétique pour la Croissance Verte – LTECV)* and to promote sustainable finance.

Article 173 is a result of the French pioneering efforts, such as, the Socially Responsible Investing (SRI) Label and the Articles 224 and 225 of the Grenelle II law. SRI Label is a government certification that takes into consideration the social and environmental impact of firms in order to promote a more sustainable economy. Therefore it can

also be used as a tool to identify and compare sustainable and responsible investments. Moreover, the Grenelle II law implemented in 2011, established the first rules related to mandatory ESG reporting both for firms and assets management companies [Forum Pour L'Investissement Responsable, 2016].

Chapter 4

Variables and Methodology

4.1 Variables

Regarding the explained variable, ETR, although typically measured by the ratio of tax expenses to accounting income, two alternatives are included in our analysis. The two measures differ on the denominator of the ratio used to compute ETR. The first denominator is income before tax and the second is the operating cash-flow. The use of two measures for ETR improves the robustness of the results [Richardson and Lanis, 2007]. This use of operating cash-flows is justified by the possibility of controlling differences that may result from the application of different accounting methods [Zimmerman et al., 1983]. The operating cash flow results from the sum of operational profit with depreciations and amortizations. Concerning the numerator of the ratio, this investigation follows Porcano [1986], Gupta and Newberry [1997], Rego [2003] and Aksoy Hazir [2019] by using current tax expenses.

As mentioned above, in order to include the dimension of the Environmental Social Governance in our model, the Reputation Risk Index (RII) was chosen as an explanatory variable. The RRI is a measure of firm's exposure to ESG and corporate conduct risks. The index calculation methodology was created by RepRisk AG a data science company from Zurich specialized in ESG solutions and assessments. This reputation metric scores companies from 0 to 100, according to their risk exposure. Higher score represents higher risk exposure which is related to more public criticism and worse firm reputation. This risk exposure takes into consideration multiple indicators based on the 10 Principles of the UN Global Impact [United Nations, 2015]. The issues may be gathered in three groups: Environmental, Social and Governance, in which we can include local pollution, waste of resources, animal mistreatment, working conditions, human rights abuses, discrimination in employment, corruption, fraud and tax evasion. All this information is tracked and processed with machine learning and artificial intelligence techniques that combined with human analysis, results in the quantification of the RRI score for each firm. The ORBIS Database allowed the extraction of RRI values of 2016, 2017 and 2018.

Following the literature, the variables Size, Leverage, Capital Intensity, Inventory Intensity, R&D Intensity and Profitability are also included in the analysis as explanatory factors that represent companies features. Capital Intensity, Inventory Intensity and R&D Intensity are considered Asset Mix variables.

Considering the literature review mentioned before and taking Gupta and Newberry [1997] as the main reference, the variables used are computed as follows:

- ETR1 – Dependent Variable, is the ratio of current tax expense to income before tax.
- ETR 2 – Alternative dependent variable, consists in the ratio of current tax expense to operating cash-flows.
- SIZE is the natural logarithm of total assets.
- LEV is the ratio between long term debt and total assets. It represents the financing decisions of firms.
- CAP_INT represents the Capital Intensity and it's computed as the ratio of net property, plant and equipment to total assets.
- INV_INT consists in the variable for inventory intensity and it's the ratio of total inventories to total assets.
- RD_INT is measured as R&D expenditure divided by net sales.
- ROA is a proxy of profitability and is defined as the ratio between pre-tax income and total assets.
- RRI is a reputation risk exposure metric with a score value between 0 and 100.

The Appendix 1 summarizes the definition of variables, expected sign and research hypothesis.

4.2 Methodology

The purpose of this section is to explain the methodology used to test the research hypothesis described in previous chapters. In this analysis, a panel data multivariate model is used in order to capture possible explanatory effects of the firm variables on ETR.

A panel data or longitudinal data is a way of structuring data. It consists in a multidimensional framework that combines a time series dimension (t) and cross-sectional dimension (n). Briefly, it can be defined as the same group of cross section observations analyzed over time [M. Wooldridge, 2002]. According to Hsiao [2003], panel data has multiple advantages that benefit an econometric estimation. Firstly, it allows the test of a more complex model than just cross-sectional or time-series analysis. Secondly, it improves the efficiency of regression estimates, because panel data increases the degrees

of freedom and reduces the collinearity problem among explanatory variables. Finally, longitudinal data has a better ability to control the effects of unobserved variables.

In terms of the regression analysis, the estimation process is carried out using *Generalized Least Squares* (GLS) estimator. We reject the most common approach, the OLS estimator because it could be statistically inefficient or even biased on this type of analysis. As a result, GLS is chosen for being a more efficient estimator than OLS.

There are two types of panel data regression models: (1) with fixed effects or (2) with random effects. In order to choose the best model for our analysis a *Hausman Test* must be performed. So as to perform this test, it's necessary to first estimate the model with random effects estimator. For that reason, we use the estimation method Panel EGLS (Cross section random effects) in this step. As the *Hausman Test* results are statistically significant, for both ETR models, we reject the Null Hypothesis. Consequently, it's more appropriate the use of fixed effects to estimate the model. Therefore, to estimate the regression model we use Generalized Least Squares (GLS) cross-section weights with cross-section fixed effect. These fixed effects allow us to control the effect of any omitted variable with time-invariant values. This means, it controls the effect of unobservable variables that do not change across time but may change between the companies analyzed.

The choice of cross-section weights for GLS weight specification means that we are assuming the existence of heteroskedasticity. By performing a White Test, a residual test, we rejected the null hypothesis, and as a result, we proved the existence of heteroskedasticity, for ETR2. In the case of ETR1, the White test could not be performed due to near singular matrix error.

4.3 Regression Model

To test the research hypothesis, two empirical models are used. These two regression models differ on the dependent variables used, ETR1 and ETR2. Therefore the models used in this analysis have the following forms:

$$\begin{aligned} ETR_1 = \beta_0 + \beta_1 SIZE_{it} + \beta_2 LEV_{it} + \beta_3 CAP\_INT_{it} + \beta_4 INV\_INT_{it} + \\ \beta_5 RD\_INT_{it} + \beta_6 ROA_{it} + \beta_7 RRI_{it} + \epsilon_{it} \end{aligned} \tag{4.1}$$

$$\begin{aligned} ETR_2 = \beta_0 + \beta_1 SIZE_{it} + \beta_2 LEV_{it} + \beta_3 CAP\_INT_{it} + \beta_4 INV\_INT_{it} + \\ \beta_5 RD\_INT_{it} + \beta_6 ROA_{it} + \beta_7 RRI_{it} + \epsilon_{it} \end{aligned} \tag{4.2}$$

Where, the dependent variable, ETRit , represents the effective tax rate of firm i in year t, and the explanatory variables are SIZEit, the firm dimension, LEVit, the firm capital structure, CAP_INTit, INV_INTit and RD_INTit as asset mix variables, ROAit, a proxy of profitability and RRIit, a reputation risk index.

4.4 Sample

The data used in this dissertation comes from the database ORBIS, managed by Bureau Van Dijk, that provides the accounting information from annual accounts in a standardized and comparable framework. The analysis is based on a sample of listed French firms and comprises a 3-year timeframe from 2016 to 2018. The initial sample consists of 775 companies. Considering the sample selected, this thesis uses a micro approach to calculate the ETR because it examines financial statements' data. On the contrary, the macro approach based on aggregate national data is not used. The data included in the investigation is ex-post.

To ensure that the ETR values are in the range 0 to 1, some corrections were done, following the criteria of Gupta and Newberry [1997]. First, if the tax expenses are negative, ETR is equal to 0. Second, if the income before tax (or operating cash flow) is negative and the tax expenses are positive, then ETR is equal to 1. These adjustments control potential bias in this analysis and allow the inclusion of firms with negative income before tax on the sample. Other studies, such as Kraft [2014], Ramalhosa [2015] and Ribeiro et al. [2015] also followed this strategy.

In order to have more accurate results in this analysis, several firms were excluded from the sample, according to some of the cleaning data criteria defined by Richardson and Lanis [2007]. Therefore, we excluded from the sample:

1. Firms whose ISIN number was not from France;
2. Companies with unavailable information for the computation of our ETR measures;
3. Firms with missing data to calculate explanatory variables;
4. Financial firms, according to NACE Rev. 2 code, since this type of companies usually faces different regulation;
5. Companies with ETR larger than 1, in cases where tax expense exceeds income before tax. According to Stickney and Mcgee [1982], these firms difficult the interpretation and the comparison of ETR values between the sample members.

The final sample consists of a group of 359 French listed firms, which results in 1077 firm year observations. In the Appendix it is possible to find the table Appendix 2 that summarizes in more detail the sample selection process.

Chapter 5

Results

5.1 Univariate Results

In this section, the univariate analysis is described through the descriptive statistics and the correlations between variables.

Table 5.1 discloses the summary descriptive statistics of dependent and explanatory variables for the period between 2016 and 2018. These univariate results indicate that the mean values of ETR1 and ETR2 are respectively, 29% and 19%. This gap on the mean values was expected, because pre-tax income values tend to be smaller than the operating cash flow (in accordance with Richardson and Lanis [2007]). Furthermore, the average of ETR1 is in line with the French statutory tax rate of 33,3% in 2016-2017 and 33% in 2018.

The firms from the sample have an average long-term debt to total assets ratio of 16%, which means that 16% of the company's assets are financed with long-term debt. As a result, on average, these companies do not have a high level of leverage that may represent a risk of default on their financial obligations. However, in terms of profitability, the average return on assets (ROA) is negative (-0.001056). Taking the gap between minimum and maximum value of ROA into account, the mean value should be complemented with the median value, 0.033037. This value still indicates a low profitability level of firms relatively to their total assets. The type of company activity sector may be an explanation for these results, because of the high level of total assets used in some industries. Regarding fixed assets intensity, there is a considerable disparity between minimum and maximum values. As a consequence, median value of capital intensity, approximately 10%, is more accurate than the mean value of approximately 17%. Therefore, in general, firms register a low level of capital intensity. The same trend is present on inventory intensity. Considering R&D intensity, the results show a small mean value of 13%. This low intensity is also reiterated by the median value (0%), which means that half or more than half of the companies in the sample have no Research and Development expenses. Ribeiro et al. [2015] also registered low values of R&D intensity on listed firms, namely on London Stock Exchange companies. These values indicate that, in the next phase of the analysis,

the regression of the model, the variable RD_INT is unlikely to be considered relevant. For the Reputation Risk Index, the maximum value is 57 which means that the company with worse reputation risk is scored with 57 points out of 100. Nevertheless, at least 50% of the companies from the sample has a score of 0, as the median value is 0.

TABLE 5.1: Descriptive Statistics

	Mean	**Median**	**Maximum**	**Minimum**	**Std. Dev.**
ETR1	0.293974	0.262160	1.000000	0.000000	0.288028
ETR2	0.188146	0.128177	1.000000	0.000000	0.246041
SIZE	12.71860	12.47786	19.46155	7.535830	2.438281
LEV	0.164282	0.130797	6.531707	0.000000	0.283399
CAP_INT	0.167010	0.099714	0.920074	$6.84E-06$	0.182302
INV_INT	0.106593	0.067086	0.646737	0.000000	0.122979
RD_INT	0.132367	0.000000	26.60000	−0.006537	1.310037
ROA	−0.001056	0.033037	1.031451	−2.293282	0.183626
RRI	2.942433	0.000000	57.00000	0.000000	7.857255

Table summarizes univariate statistics for dependent and explanatory variables. ETR1 the dependent variable, is the ratio of current tax expense to income before tax; ETR 2 is the alternative dependent variable, that consists in the ratio of current tax expense to operating cash-flows; SIZE is the natural logarithm of total assets; LEV is the ratio between long term debt and total assets; CAP_INT represents the Capital Intensity and it's computed as the ratio of net property, plant and equipment to total assets; INV_INT consists in the variable for inventory intensity and it's the ratio of total inventories to total assets; RD_INT is measured as R&D expenditure divided by net sales; ROA is a proxy of profitability and is defined as the ratio between pre-tax income and total assets; RRI is a reputation risk exposure metric with a score value between 0 and 100.The sample includes 359 firms for the period 2016-2018 which represents 1077 firm-year observations.

Table 5.2 shows the correlations between ETR1, ETR2 and the other explanatory variables.

As expected, ETR1 and ETR2 are positively and highly correlated since both of them measure the effective tax rate and only differ on the denominator (in accordance with Ribeiro et al. [2015]). ETR1 has a negative correlation with SIZE, LEV, ROA and RRI. It's relevant to point out that the negative impact of firm dimension on ETR supports the political power theory. In the same way, the negative correlation between ETR1 and ROA may show that when companies are more profitable, they have more resources for tax planning strategies that permit ETR reductions (similar results to Kraft [2014]). The inverse ETR1-RRI correlation indicates that, when the reputation risk score increases there is a decrease in effective tax burden. This may indicate that the bad firm reputation may be caused by the use of aggressive tax planning practices. The negative correlation between ETR1 and LEV is in accordance with Vandenbussche et al. [2005]. On the other hand,

ETR1 is positively correlated with the three asset mix variables: CAP_INT, INV_INT and RD_INT. All of them registered a low level of correlation. Fernández-Rodríguez and Martínez-Arias [2014] also find this positive correlation on CAP_INT and INV_INT. In terms of Research and Development expenses, this positive correlation does not reflect the expected beneficial effect of the tax incentives related to R&D expenses. With regards to ETR2 correlations, this variable has similar associations with all the explanatory variables, except for CAP_INT which has a negative correlation.

Concerning correlations between explanatory variables, LEV and SIZE have a positive correlation (in accordance with Kraft [2014] and Aksoy Hazir [2019]). This result is in line with the idea that a superior size can represent a greater ability to increase debt level. In addition, LEV and CAP_INT also have a positive correlation, as in Ribeiro et al. [2015] investigation. This correlation is expected since the higher the level of Net Property Plant and Equipment, the higher the quantity of assets available for collateral. Therefore, there is a reduction of the risk of the lender and an increase in the probability of the firm getting a loan. On the contrary, LEV and INV_INT have a negative correlation. CAP_INT and INV_INT have a negative correlation that supports the substitution dynamics between the two variables. Moreover, the correlation between SIZE and CAP_INT is positive, which supports the position that larger companies are more intensive in fixed assets. In addition, larger companies tend to be more profitable as SIZE and ROA are positively correlated (in accordance to Aksoy Hazir [2019]). On the other hand, ROA and LEV have a relevant negative correlation which corroborates the idea that profitable firms are more able and willing to finance themselves with internal capital. It's also relevant to highlight that RRI is strongly positively correlated with SIZE and also has a positive correlation with ROA. A possible explanation for this correlation is the fact that higher and more profitable companies have more visibility and, as a consequence, are subjected to greater public criticism. On the other hand, bigger firms tend to take actions in a wider range of areas than smaller companies, which may influence more ESG indicator scores, once more activity translates into a greater likelihood of underperforming on some factor.

TABLE 5.2: Variables Correlations

	ETR1	ETR2	SIZE	LEV	CAP_INT	INV_INT	RD_INT	ROA	RRI
ETR1	1.000000								
ETR2	0.726010	1.000000							
SIZE	−0.027036	−0.139853	1.000000						
LEV	−0.043560	−0.079701	0.052679	1.000000					
CAP_INT	$4.73E-05$	−0.155086	0.203180	0.148590	1.000000				
INV_INT	0.006584	0.007121	−0.026594	−0.001657	−0.038194	1.000000			
RD_INT	0.014797	0.055453	−0.068354	0.026406	0.007753	−0.070296	1.000000		
ROA	−0.154542	−0.186324	0.248269	−0.473825	0.039452	−0.018119	−0.173165	1.000000	
RRI	−0.021680	−0.063314	0.616567	0.009780	0.071016	−0.087803	−0.031466	0.080734	1.000000

The table shows the correlation matrix of variables. ETR1 is the ratio of current tax expense to income before tax; ETR 2 consists in the ratio of current tax expense to operating cash-flows; SIZE is the natural logarithm of total assets; LEV is the ratio between long term debt and total assets; CAP_INT represents the Capital Intensity and it's computed as the ratio of net property, plant and equipment to total assets; INV_INT consists in the variable for inventory intensity and it's the ratio of total inventories to total assets; RD_INT is measured as R&D expenditure divided by net sales; ROA is a proxy of profitability and is defined as the ratio between pre-tax income and total assets; RRI is a reputation risk exposure metric with a score value between 0 and 100.The sample includes 359 firms for the period 2016-2018 which represents 1077 firm-year observations.

5.2 Multivariate Results

Regression of equations (4.1) and (4.2) was performed using Generalized Least Squares (GLS) cross-section weights with cross-section fixed effects. The regression results are reported in Table 5.3.

Regarding RRI, there is a negative and statistically significant association between Reputation Risk Index and ETR1 for 1% significance level (β_7 =-0.000833 , t= - 7.618253). According to this result, when the reputation risk score increases the effective tax burden decreases. Consequently, firms with worse reputation rating, face lower ETR. This RRI-ETR1 relationship may be explained by the fact that ESG Reputation Risk increases due to aggressive tax planning practices undertaken by firms. These irresponsible tax actions combined with greater public awareness for controversial firm governance decisions may indeed generate a bad firm reputation and influence the RRI. However the coefficient value is very low, and for ETR2 it's positive (β_7 = 0.000937 ; t=4.346466). Therefore there is some inconsistency in the results due to this change of sign. Despite this lack of consensus on the association sign (if the relation is positive or negative), H1 is confirmed, ETR is related to ESG reputation.

We find that the estimated coefficient for SIZE is negative and significantly associated with both ETR1 and ETR2 for 1% significance level (ETR1: β_1=-0.091891 , t=-11.51501 ; ETR2: β_1 =-0.093414 , t=-18.78236). These results support H2 which confirms the political power theory. Subsequently, this analysis evidences that larger firms tend to have more capability to reduce their ETR because their dimension allows them to be more prepared to take tax planning strategies and to take stronger political lobbying actions. This result is consistent with the investigation works of Porcano [1986], Kim and Limpaphayom [1998], Derashid and Zhang [2003] and Richardson and Lanis [2007]. The result is also in line with the conclusions of the aforementioned *Observatoire des Multinationales*.

In addition, the results show a positive and statistically significant association between LEV and both ETR1 and ETR2, for 1% significance level (ETR1: β_2=0.044572 , t=3.958334 ; ETR2: β_2=0.033895 , t=7.968370). Therefore H3 is rejected. This means that in the case of the analyzed sample, it is not verified that companies prefer to use debt due to tax-shield effect, defended by other authors. This result is in line with Feeny et al. [2005], Crabbé [2006] and Chen et al. [2010]. This relationship is in agreement with what had been previously noted, regarding the low value of long-term debt of French listed companies.

It's also possible to observe that, contrary to expectations, the coefficient for CAP_INT is positive and significantly related to ETR1, at 1% significance level (β_3= 0.116446 ; t=3.236512). Therefore we reject H4. Fernández-Rodríguez and Martínez-Arias [2014] registered the same result for India. Moreover, according to Delgado et al. [2012], firms can only reduce their tax burden after reaching a certain level of capital intensity. Therefore, the low proportion of net property, plant and equipment on the analyzed sample can be an explanation for this result. On the other hand, CAP_INT association with ETR2 is negative

but not statistically significant (β_3=-0.008388 ; t=-0.380363). The ETR2 result meets the opinions from Harris and Feeny [2003], Rodríguez [2004], Liu and Cao [2007] and it may be also justified by the low levels of tangible fixed assets.

As expected, the coefficient for INV_INT is positive and statistically significant at 1% for both ETR1 and ETR2 (ETR1: β_4=0.279018 , t=4.268187 ; ETR2: β_4=0.415100 , t=17.62739). This evidence supports H5. This relation is in accordance with Zimmerman et al. [1983],Gupta and Newberry [1997] and Richardson and Lanis [2007].

The coefficient of R&D is not significant for both ETRs, which is also counter to hypothesis expectations. Nevertheless, it confirms the evidence in univariate analysis. This result indicates that, despite French tax incentives for research and development expenses, these expenses do not significantly influence ETR. The low R&D intensity of French listed firms can explained this result. So we reject H6. The Široký et al. [2017] research about EU Member States also conclude that R&D expenses have no effect on the variability of ETR.

Regression coefficient for the variable ROA evidences a negative and statistically significant relation with both ETR1 and ETR2, for 1% significance level (ETR1: β_6=-0.190500, t=-6.558982 ; ETR2: β_6= -0.174128 , t=-9.810472). For that reason, H7 is confirmed. This negative association was also verified by Manzon, Jr. and Plesko [2001] and Kraft [2014] and it can be explained by the fact that more profitable companies have more resources than less profitable firms to resort tax planning and to benefit more efficiently from tax incentives.

Overall, the results show that firm ESG reputation is a significant explanatory factor of ETR. However, it is not clear if the association is positive or negative. For both models, the firms that face lower ETR have higher dimension and profitability levels and lower inventory intensity. Contrary to expectations, debt is not preferably used to reduce tax burden and R&D expense is not statistically significant.

TABLE 5.3: Regression Results

Explanatory Variable	ETR1	ETR2
C	1.407494***	1.325056***
	(13.73035)	(21.13462)
SIZE	−0.091891 ***	−0.093414***
	(−11.51501)	(−18.78236)
LEV	0.044572***	0.033895***
	(3.958334)	(7.968370)
CAP_INT	0.116446***	−0.008388
	(3.236512)	(−0.380363)
INV_INT	0.279018***	0.415100***
	(4.268187)	(17.62739)
RD_INT	0.007118	−0.001286
	(0.479360)	(−0.091892)
ROA	−0.190500***	−0.174128***
	(−6.558982)	(−9.810472)
RRI	−0.000833***	0.000937***
	(−7.618253)	(4.346466)
Dummy Cross-Section		
R-squared	0.993884	0.995865
Adjusted R-squared	0.990744	0.993742
F-statistic	316.5411	469.1033
Prob(F-statistic)	0	0

The table shows the estimated coefficients of models (4.1) and (4.2). ETR1 is the ratio of current tax expense to income before tax; ETR 2 consists of the ratio of current tax expense to operating cash-flows; SIZE is the natural logarithm of total assets; LEV is the ratio between long term debt and total assets; CAP_INT represents the Capital Intensity and it's computed as the ratio of net property, plant and equipment to total assets; INV_INT consists of the variable for inventory intensity and it's the ratio of total inventories to total assets; RD_INT is measured as R&D expenditure divided by net sales; ROA is a proxy of profitability and is defined as the ratio between pre-tax income and total assets; RRI is a reputation risk exposure metric with a score value between 0 and 100.The sample includes 359 firms for the period 2016-2018 which represents 1077 firm-year observations. Both regressions were estimated using Generalized Least Squares (GLS) cross-section weights with cross-section fixed effect. * means 10% individual significance, ** means 5% individual significance and *** means 1% individual significance. In parenthesis are observed t-statistic values.

5.3 Complementary Analysis

In this section, some robustness checks are performed in order to achieve a more complete and accurate analysis.

5.3.1 Capital Intensity > 10%

Given that in the multivariate results, the CAP_intensity coefficient registered a sign contrary to the expected, we intend to proceed with a robustness test focused on this variable. Thus, the model is re-estimated with a redefinition of the sample to half (180 companies). Companies are included in the new sample if the average CAP_intensity value for the 3 years under analysis is equal or greater than 10%. In this case, the average value of CAP_intensity increases to 29.5% and the median to 24.5%, while the original model mean value was 16.7%.

Taking the argument that capital intensity must reach a certain level to be able to impact ETR as expected [Delgado et al., 2012] into consideration, this complementary analysis intends to test if the increase in the proportion of fixed assets generates a change in the signal of the CAP_intensity coefficient, i.e. if it is verified that firms with more capital intensity benefit from a lower ETR.

Considering the models (4.1) and (4.2), a GLS cross-section weights with cross-section fixed effect estimation is performed. Despite the increase in the proportion of fixed assets, the results, for ETR1, continue to show a positive and statistically significant association between CAP_intensity and ETR, at 1% level of significance. In terms of ETR2, the coefficient also remains not statistically significant. The regression results table can be found in appendix 3.

5.3.2 Short-term Leverage

So as to perform a complementary test to check the previous results, another leverage measure is used. As companies may also use short-term financing, we chose to introduce the variable short-term leverage (ST_LEV) in the analysis. This variable is the ratio between short term debt and total assets. The regression model includes then a new potential ETR determinant: ST_LEV. In order to better organize the explanatory factors, previous variable LEV is now designated as LT_LEV. Therefore the model used is as follows:

$$\begin{aligned} ETR_i = \beta_0 + \beta_1 SIZE_{it} + \beta_2 LT\_LEV_{it} + \beta_3 ST\_LEV_{it} + \beta_4 CAP\_INT_{it} + \\ \beta_5 INV\_INT_{it} + \beta_6 RD\_INT_{it} + \beta_7 ROA_{it} + \beta_8 RRI_{it} + \epsilon_{it} \end{aligned} \tag{5.1}$$

In terms of descriptive statistics (in appendix 4), the mean value of short-term debt to total assets ratio is 0.064 which means that only 6% of the company's assets are financed

with short-term debt. Therefore, on average, the analyzed companies have a low level of short-term leverage.

This analysis intends to test if short-term debt influence ETR variability. To estimate this model we use GLS cross-section weights with cross-section fixed effect. According to the regression results, for ETR1, the coefficient of ST_LEV is positive and statistically significant at a 5% significance level. This result reinforces the insights previously described about LEV in the multivariate analysis. It is again verified that debt is not preferably used to reduce tax burden. This result conforms with Crabbé [2006] that also included short-term leverage on robustness checks. On the other hand, ST_LEV is not statistically significant for ETR2. The regression results table can be found in appendix 5.

Chapter 6

Conclusion

In the last years, firms' environmental, social and corporate governance performance (ESG) has gained more relevance and it has been associated with other corporate issues, such as financial performance, market value and tax avoidance. However, studies that focus specifically on the relationship between ESG ranking and ETR are still quite scarce. For that reason, the main motivation of this thesis is to respond to this lack of research on this subject by providing evidence on the inclusion of measure ESG on ETR analysis.

Therefore, this dissertation investigates the determinants of ETR, namely the association between ESG indicators and ETR. This research aims, in particular, to test if the ESG reputation of a firm is a significant explanatory factor of ETR. For this reason, we include an ESG performance variable in the set of possible explanatory variables for ETR variability, in addition to only testing the impact of the variables typically used in this kind of investigation. The other independent variables of our regression models are firm dimension, firm capital structure, firm profitability, capital intensity, inventory intensity and R&D intensity.

The regression models are estimated through a Generalized Least Squares (GLS) estimator with cross-section weights and cross-section fixed effects. The regression results provides insights into the association between ETR and the financial, investment and ESG decisions of these firms, based on a sample of 359 listed French companies for the period of time between 2016 and 2018. In particular, the results allow us to conclude that, despite the inconsistency in the sign of the coefficient, ESG firm reputation is a significant explanatory factor of ETR. Moreover, the results confirm that companies with higher dimension and profitability levels and lower inventory intensity face lower ETR. Contrary to expectations, capital intensity has a positive coefficient; R&D expense is not an explanatory factor with statistical significance and firms do not tend to use debt to reduce ETR.

In the complementary analysis, we perform two robustness tests. In the first test,the re-estimation of the model, according to a higher level of capital intensity criteria, continues to reveal a positive association between ETR1 and capital intensity. In the second test,

the inclusion of short-term financing on the model confirms that, in the case of French listed firms, as for long-term debt, short-term leverage does not have a negative association with ETR, as expected.

It is pertinent to note that this work has some limitations, namely the inconsistency in the sign of the relationship between ESG reputation and ETR. The short period of time analyzed is also a limitation. Finally, the construction of ETR variables only with financial statement data may also represent a limitation, as tax data is more accurate.

Future research into these domains could include other ESG rankings in the investigation tests, in order to better clarify their association to ETR. In addition, the inclusion of more years in the analysis could allow a more complete and accurate understanding of the influence of the explanatory variables on ETR and their evolution.

Appendix A

Appendix

Appendix 1 - Variables Definition, Predicted Sign and Research Hypothesis

Variables	Definition	Predicted Sign	Research Hypothesis
ETR1	Current Tax Expense / Pre-tax income		
ETR2	Current Tax Expense /Operating Cash-flows		
RRI	Reputation Risck Score between 0 and 100	+/-	H1. ETR is related to the ESG reputation of firms.
SIZE	Log (Total Assets)	-	H2. The Political Power Theory is verified
LEV	Long-term Debt / Total Assets	-	H3. Leverage is inversely related to ETR.
CAP_INT	Net Property Plant and Equipment / Total Assets	-	H4. Capital Intensity is inversely related to ETR
INV_INT	Total Inventories / Total Assets	+	H5. Inventory Intensity has a positive relation with ETR.
RD_INT	R&D Expenses / Net Sales	-	H6. R&D Intensity is inversely related to ETR.
ROA	Net Income / Total Assets	+/-	H7. ETR is related to the Profitability of firms.

Appendix 2 - Sample Selection Procedure

Criteria	Number of Firms
French listed firms from ORBIS Database	775
Firms whose ISIN number was not from France	(5)
Firms with unavailable information to calculate all the variables	(293)
Financial firms according to NACE Rev. 2 code	(4)
Firms with ETR larger than 1	(54)
Firms without RepRisk Index score data	(60)
Final Sample	359
Number of firm year observations	1077

This table explains the process of sample selection. The final sample comprises 359 listed French firms for a 3-year timeframe from 2016 to 2018.

Appendix 3 - Regression Results of CAP_INT Complementary Analysis

Explanatory Variable	ETR1	ETR2
C	0.671588***	0.428403***
	(4.976618)	(4.220829)
SIZE	−0.032392***	−0.025246***
	(−3.289756)	(−3.307991)
LEV	0.068622***	0.048033***
	(2.971937)	(2.619716)
CAP_INT	0.112348***	0.022958
	(2.643383**)**	**(**0.890889**)**
INV_INT	0.129782	0.303906***
	(1.396869)	(4.791184)
RD_INT	0.006876	0.003188
	(0.962667)	(0.503244)
ROA	−0.275362***	−0.090000***
	(−16.57298)	(−2.151167)
RRI	−0.002298***	0.001086***
	(−4.470762)	(4.348720)
R-squared	0.994520	0.983906
Adjusted R-squared	0.991633	0.975426
F-statistic	344.4522	116.0258
Prob(F-statistic)	0.000000	0.000000

The table shows the estimated coefficents of model (4.1) and (4.2) for a new sample. This sample includes 180 companies with average CAP_intensity value for the 3 years under analysis equal or greater than 10%. ETR1 is the ratio of current tax expense to income before tax; ETR 2 consists in the ratio of current tax expense to operating cash-flows; SIZE is the natural logarithm of total assets; LT_LEV is the ratio between long term debt and total assets; ST_LEV is the ratio between short term debt and total assets; CAP_INT represents the Capital Intensity and it's computed as the ratio of net property, plant and equipment to total assets; INV_INT consists in the variable for inventory intensity and it's the ratio of total inventories to total assets; RD_INT is measured as R&D expenditure divided by net sales; ROA is a proxy of profitability and is defined as the ratio between pre-tax income and total assets; RRI is a reputation risk exposure metric with a score value between 0 and 100. Both regressions were estimated using Generalized Least Squares (GLS) cross-section weights with cross-section fixed effect. * means 10% individual significance, ** means 5% *** means 1%. In parenthesis are observed t-statistic values.

Appendix 4 - Descriptive Statistics ST_LEV

	Mean	**Median**	**Maximum**	**Minimum**	**Std. Dev.**
ST_LEV	0.063930	0.044198	0.785091	0.000000	0.073449

This table summarizes univariate statistics for the variable ST_LEV.

Appendix 5 - Regression Results of ST_LEV Complementary Analysis

Explanatory Variable	**ETR1**	**ETR2**
C	1.526745***	1.333842***
	(15.89224)	(20.96821)
SIZE	−0.101624***	−0.094114***
	(−13.64438)	(−18.59698)
LT_LEV	0.054795***	0.034149***
	(5.105930)	(8.300785)
ST_LEV	0.063573**	0.001059
	(2.235779)	(0.047953)
CAP_INT	0.123815***	−0.008420
	(3.497165)	(−0.377000)
INV_INT	0.263823***	0.413092***
	(3.911526)	(17.47050)
RD_INT	0.009091	−0.001246
	(0.616137)	(−0.088740)
ROA	−0.203257***	−0.175052***
	(−7.012962)	(−9.632275)
RRI	−0.000858***	0.001011***
	(−9.805519)	(4.851707)
R-squared	0.993386	0.995624
Adjusted R-squared	0.989975	0.993367
F-statistic	291.2416	441.1917
Prob(F-statistic)	0.000000	0.000000

The table shows the estimated coefficents of model (5.1). ETR1 is the ratio of current tax expense to income before tax; ETR 2 consists in the ratio of current tax expense to operating cash-flows; SIZE is the natural logarithm of total assets; LT_LEV is the ratio between long term debt and total assets; ST_LEV is the ratio between short term debt and total assets; CAP_INT represents the Capital Intensity and it's computed as the ratio of net property, plant and equipment to total assets; INV_INT consists in the variable for inventory intensity and it's the ratio of total inventories to total assets; RD_INT is measured as R&D expenditure divided by net sales; ROA is a proxy of profitability and is defined as the ratio between pre-tax income and total assets; RRI is a reputation risk exposure metric with a score value between 0 and 100.The sample includes 355 firms for the period 2016-2018 which represents 1065 firm-year observations. Both regressions were estimated using Generalized Least Squares (GLS) cross-section weights with cross-section fixed effect. * means 10% individual significance, ** means 5% *** means 1%. In parenthesis are observed t-statistic values.

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