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Corporate tax avoidance and tax planning strategies: how market competition affects tax planning and tax avoidance in Europe.

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ABSTRACT

Does competition in the market influence decisions inside a company? Is it relevant for taxation matters? Do managers take into consideration the market capitalization when they make decisions? Do product market imperfections influence earnings (and therefore taxation)? Are other factors important for tax planning? These are the beginning questions for my analysis. In this final paper I gave an overview about taxation in the European Union, focusing then on tax avoidance and tax planning linked to market competition. In the empirical part I analyse many companies in the European Union to see if total taxation is impacted by market competition.

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Introduction

Not long ago, international taxation law issues were important only to few tax specialists, mainly tax advisers of large multinational corporations and governments. However, nowadays, because of globalization, international taxation issues are more and more important to every corporation in the market. Besides that, every corporation is nowadays included in a competitive scenario where it has to do with many other companies and has always to compare to others. Since every firm doesn't operate in isolation, taxation matters have to take into consideration also this issue. The ability to influence the price, quality and nature of the product in the marketplace to a greater extent than other product market competitors, is called "product market power" and it's studied also for taxation matters.

Taxation issues contain both economic and legal matters, since taxation comes first of all from regulations that every Country displays. Companies have to apply regulations to economic values and management has to lower as much as possible the taxation cost, through tax planning and, sometimes, tax avoidance. Every Country has its rules, even if there's more and more of a commonly shared conceptual framework, especially in European Union Countries, since international taxation law follows the same principles in every Country. This is the main reason why there's the idea of harmonizing taxation rules in Europe and some projects as "Base erosion profit shifting" are taking place lately in the EU.

The aim of this final work is analyzing whether bigger corporations engage more in tax avoidance. Tax authorities sometimes blame market leaders to engage in tax avoidance and to create a disadvantage also for other players in the market.

This final work is divided as follows: in the first chapter, I'm going to focus the attention on tax avoidance and tax planning. In the first part I'll give a general overview of taxation taking different definitions from different authors. Then tax avoidance is analyzed and the difference between tax avoidance and tax evasion is explained. Given a general overview, I focus more on corporate tax avoidance (the analytical part concerns only corporate taxation). I then give a definition of tax planning.

The second part of the work is about product market competition and the relationship between competition and tax avoidance. Product market competition affects not only taxation, but also earnings quality. A literary review shows how competition affects tax planning in different situations and Countries. Product market competition is analyzed under different perspectives.

First the effect of product market competitions is analyzed in comparison to conditional conservatism, then to earnings management.

In the third part, since the research concerns Countries in the European Union, there's a quick overview on tax enforcement and corporate taxation in Europe.

A paragraph is dedicated to the corporate tax harmonization in Europe, analyzing pros and cons and looking at how it could (or should) be implemented.

Then multinational profit shifting is taken into consideration since multinational firms are becoming more and more common and have many affiliates in different Countries. Multinational profit shifting is one of the most common ways of tax avoidance, since multinationals can choose where to shift their profits (and they usually shift them to low-tax Countries). Multinational profit shifting is one of the most common ways of tax avoidance, since multinationals can choose where to shift their profits (and they usually shift them to low-tax Countries).

The empirical part of the work then follows. This part looks at finding a linkage between product market competition and tax avoidance in the European Union, taking the first as dependent variable and the second as dependent variable. The final chapter gives an overview of the methodology used for the research and the steps to the regression. Data of companies located in the Member States are collected and are analyzed.

What comes out from the research is that product market competition has a real effect on tax avoidance, meaning that it decreases total taxation and therefore increases tax avoidance.

Chapter 1: taxation, tax avoidance and tax planning. Definitions ad overview

Introduction to chapter one

This first chapter gives an overview of taxation, how it works the whole system of fiscal obligations, especially when it comes to corporate taxation. Taxation issues influence many corporate decisions in different ways and it really depends on the type of decision and the burden that taxes have according to the issue. Different accounting methods are also based on different taxation methods. The main issue here is understanding to what level taxation is important when it comes to management decisions.
Accounting standards follow specific rules and taxation follows some other rules, coming from a political process (differently from accounting). On one side there are managers, on the other law makers.

Paragraph 1.2 underlines the difference between tax avoidance and tax planning. The topic then goes deeper into disclosure issues. The rest of the chapter focuses then on corporate tax avoidance (the research is based instead only on corporations). Corporations may, in fact, use loopholes, exemptions, deductions, credits, etc to lower their taxable income. Many stakeholders of the company are influenced by tax avoidance for different reasons. CEOs, for example, want both to increase earnings and lower taxable income, creating a trade-off. Moreover, managers can have compensation incentives that can determine different tax planning methods.

Tax avoidance has determinants and consequences. Determinants are some patterns in a company that can lead to tax avoidance. They can be, for example, company's ownership structure, managerial power and management incentives or, more intuitively, different tax rate in different Countries. In this case investments are made in Countries with lower tax rate, to take advantage from it.
The determinant of tax avoidance this final work wants to focus on, is product market competition. Some studies have already determined that market competition can lead to different behaviors when it comes to tax avoidance.

On the other hand, consequences come from tax avoidance and can lead to some problems, both economic and legal. Tax avoidance can, for example, have a negative impact on market price but can also influence decision-making process in a company. Real effects on investments and earnings management are also taken into consideration.

1.1 Taxation: a general overview

Taxation is the act of a taxing authority, usually government, that impose a financial obligation on its citizens or residents. Taxation is different from other forms of payment because it's not consensual and government imposes taxation through implicit and explicit forces. Taxation is a concern both for individuals and companies and it's an issue in more than one field. Tax research is important in economics and finance since it always influences accounting decisions. It has been done for a long time in different disciplines, such as accounting, finance, economics, and law (such as in academic institutions and governmental agencies). According to Hanlon and Heitzman (2010), tax policies are viewed and studied in different ways according to the different disciplines. Economists usually focus on tax compliance, tax incidence, growth effect, while finance considers taxes as market imperfections. In this way, firm value, policy decisions and investor portfolio decisions are affected by taxation rules. Tax costs and financial accounting earnings depend also on different reporting incentives. The effectiveness of tax policy depends also on how managers decide to use mix tax incentives and external reporting incentives.

Taxes possibly affect "real" corporate decisions, but it is still not clear whether they really have a strong effect or not. A way to indagate this issue is looking at tax and financial reporting incentives for these kinds of decisions. According to Shackelford and Shevlin (2001), under certain conditions, for example for firms with high level of debt, managers will decide between different accounting methods.

Book-tax tradeoffs on earnings management is important in different areas of a company, but it's interesting to focus on "real" operations and decisions, such as investment and capital structure. These decisions then, in turn, influence structure and efficiency of tax policy, that's to say that financial accounting can mitigate or increase tax incentives.

According to Hanlon and Heitzman (2010, pag. 4), one of the simplest methods to indagate tax avoidance is by looking at the book-tax difference. Taxable income is a benchmark measure of performance for financial accounting earnings. Book-tax difference gives information about

present and future earnings and gives information about earnings management. Financial accounting and taxation rules have different backgrounds.

Accounting standards follow specific rules and the goal is capturing the economics of transactions to provide useful information for company's shareholders (equity investors, contracting parties…). Tax rules, instead, come from a political process. Lawmakers have different goals from managers or economists. They usually want to discourage fraudulent activities and they want to make the economy of a Country grow. Another difference is that, while tax rules are usually specifically built for a single Country, financial accounting is cross-sectional and disciplines all income (and losses), independent from the Country where the entities are located. In other words, the difference between accounting earnings and taxable income is "aggressive" reporting for book or tax purposes. When managers manipulate earnings upward, they can choose to pay taxes on that income or to report taxable income at the unmanaged, lower amount and record the book-tax difference in the financial statement.

Revsine et al. (1998), Palepu et al. (2000) and Penman (2001) show that accounting accruals reflect more discretion than what law allows. Momentaneous differences between book and tax income show discretion in non-tax accounting accruals. Usually there are no permanent differences since they wouldn't depend on accruals. Moreover, firms are suspicious when they have higher pre-tax book income than taxable income and therefore, they could have manipulated book income upward. Corporate tax avoidance also involves the principal-agent problem. Lately effects of corporate governance have been included in the research. The first issue of tax avoidance is researchers' definition and measurement of tax avoidance. Researchers should be careful in selecting an empirical proxy (or proxies) that fit(s) best in the model and know that there are always limitations and errors linked to the sample.

1.2 Tax avoidance and tax planning

Let's start with the definition of tax avoidance. The definition itself can be problematic since there's no commonly accepted definition of tax avoidance. The term can have different meanings. The topic has to do with tax reporting, since avoidance means not reporting certain elements to pay less taxes. In general, we can say that avoidance is the reduction of explicit taxes (Hanlon, Heitzman, 2010).
According to Dyreng (2008), tax avoidance is the decrease of a firm's specific tax liability.
Tax avoidance differs firmly from tax evasion. According to Otto et al. (2015), tax evasion means having illegal arrangements, where tax liability is ignored. For example, taxpayers pay less than they are supposed to pay. It is defined as "behaving within the law, to minimize or eliminate tax". This method usually takes advantage of loopholes and mismatches. Fraud, on the other side, is a willing evasion of tax, that is usually punishable by law. In this case false statements are produced.

There are different terms to refer to tax reporting behavior. These are "aggressiveness", "sheltering", "evasion", "noncompliance". According to Weisbach (2002), shelters are gaps in the tax base and attacks on shelters are seen as attempts to expand the tax base.
Shackelford and Shevlin (2001) state that "transactions taxpayers enter into transactions with unrelated parties merely to permit them to take dubious tax positions" or "transactions that are entered into primarily for tax reasons." They furthermore state that if certain conditions apply - high level debt, for example - firms prefer to have higher accounting earnings and therefore avoid less taxes.

Hanlon (2003) and McGill and Outslay (2004) write that disclosure about taxable income in financial statements is often not complete or satisfying. Every stakeholder has their own different reason to know the amount of taxable income. For example, they could want to use it as a benchmark to compare different companies and to understand if the firm they are linked to is involved in tax avoidance (Hanlon, 2003; Lenter et al., 2003).

Tax avoidance and tax planning don't refer to the same concept, but they are, on the opposite, quite different.

While tax avoidance is the reduction of explicit taxes (Hanlon, Heitzman, 2010), tax planning means involving in proactive strategies to lower the taxable income and, therefore, the taxes due. The goal of tax planning is minimizing tax liabilities, within the boundaries of law. When a company uses tax planning, it takes advantage of tax incentives, deductions, credits and exemptions in order to reduce the overall tax burden. The income flowing is much lower when policy changes are aimed at broadening the tax base. The study finds that tax base broadening reforms influence both inward (income into a foreign affiliate) and outward profit shifting (income out of a foreign affiliate).

Anti-avoidance rules usually ward off companies from shifting profits out of foreign affiliates. Other tax-broadening rules, like restrictions on deductibility of tax losses or group tax relief, are relevant for profit shifting too. Thanks to these rules, profit shifting into a foreign affiliate is prevented. However, other tax base–broadening rules, such as restrictions on the deductibility of tax losses or on group tax relief, are equally relevant to profit shifting. In particular, these rules reduce the incentives for multinational companies to shift profits *into* a foreign affiliate.

According to Ftouhi and Ghardallou (2019), tax planning strategies are used by national and international firms in order to avoid tax obligation. Nevertheless, tax planning is mainly used by multinational corporations that are set in different Countries. Multinational firms exploit different tax systems of different states, choosing their capital according to different taxations.

Decreasing taxes allow multinational companies to increase income after-taxes. This can be done using different practices, such as: (1) transfers of revenues by geographical area; (2) redevelopment of the company; (3) tax haven; and (4) loopholes in tax legislation.

There are different tax planning measures identified by previous studies. Some studies measure tax planning by tax savings (Scholes and Wolfson, 1992; Rego, 2003; Slemrod, 2004; Frank et al., 2009; Wilson, 2009). Tax planning practices create permanent gaps. Another important measure for tax planning is “cash effective tax rate” and it’s mainly used in the US and UK. It is a measure of the difference between accounting profit and taxable profit. ETR measures the degree of risk, but also the quality of tax strategy. The differences between tax systems can be shown thanks to ETR and in this way the level of tax burden can be identified (Harris and Feeny, 2000).

Robinson et al., 2010 and Taylor and Richardson, 2014 find that ETR reflects aggressive tax planning strategies. ETR is important because it measures the distribution of tax burden through tax incentives.

As an alternative to ETR, Graham and Tucker (2006) use tax litigation. This is a direct measure of tax evasion. According to these studies, if a company has troubles with tax administration on tax matters, it's a sign of tax evasion. Mills (1998) states that the gap between accounting and taxable income can be associated to aggressive tax planning.

Goncharov, I., and Jacob, M. (2014) study how companies use accrual for tax planning. Accruals change timing and matching problems in cash flows and therefore they smooth taxable income. Depending on accruals, the distribution of corporate tax revenues can be different. The study finds that tax revenues in high accrual countries are less volatile. Countries with higher level of public spending incentivize accruals and smoother tax revenues. Accruals can be costly for tax spending because they can increase cyclicality of revenues. Therefore, revenues are more cyclical in high tax Countries.

1.3 Corporate tax avoidance

In this paper corporate tax avoidance will be taken into consideration. Corporate tax avoidance is a legal strategy that makes corporations minimizing their tax liability to reduce the amount of taxes they are asked to pay. Corporations often use loopholes, exemptions, deductions, credits, etc to lower the taxable income. Corporate tax avoidance influences many stakeholders of a company, first, shareholders and managers. Corporations usually deal with another problem as wll, namely, the separation between ownership and control.

Risk-neutral shareholders would like to maximize profits (and expect managers to do so), which include reducing tax liability (Slemrod, 2004). Even if tax avoidance is not, per se, a reason for agency problems, the separation of ownership and control could influence tax decisions, and this leads to agency problems. Managers of a company should find the solution that minimize agency costs and shareholders should offer appropriate benefits to managers so that they make tax-efficient and profit maximizing decisions.

According to Desai et al. (2007), when governance is weak, an increase in tax rate leads almost immediately to lower tax revenues, on the other side, when governance is strong, an increase in tax rate leads to an increase in tax revenues. Identifying tax shelter firms can be difficult. First, there's the selection bias, because those firms were either caught or formally charged or that use recent disclosure rules. Secondly, the use of tax shelter is endogenous because firms can avoid taxes without any shelters.
There are many different tax avoidance strategies, like income shifting to tax havens (Dyreng and Lindsey, 2009), buying complex hybrid securities (Engel, Erickson, and Maydew 1999), and engaging in other tax shelters (Wilson 2009).

Hanlon and Heitzman (2010) define corporate tax avoidance as the reduction of explicit taxes paid. Tax avoidance can be seen as the difference between firm's unmanaged and managed tax amount. The strategies can lead to permanent or temporary book-tax differences or no book-tax difference at all. Namely the difference between home-country statutory tax rate times pre-tax earnings and current taxes paid. In this way, aggressiveness of managers' behavior in reducing taxes can be seen.
Since CEOs both want to increase earnings and lower taxable income, there's a tradeoff and they should choose the most effective strategy. Hanlon and Heitzman (2010) state that the book-tax tradeoff can affect investment and capital structure decisions, that affect economic activity and change the efficiency of tax policy. Financial accounting can increase or decrease tax incentives.

According to Atwood T., Drake M., Myers J., and Myers L. (2012), firms pay more taxes when the asked book-tax conformity is higher, a worldwide approach is used and there's a strong tax enforcement. They compare three different tax systems characteristics: required book-tax, worldwide vs territorial approach, strength of tax enforcement. The study is aimed at understanding whether the different tax systems impact tax avoidance. The result is that firms avoid more taxes when the home country has lower required book-tax conformity, a worldwide approach, and a weaker tax enforcement.

Taxable income and accounting income differ because of many factors. The two accounting systems have different goals and, even if firms are more and more international, regulations are determined nationally.

Firms with higher pre-tax book income could perhaps have manipulated book income upward. But after Enron and WorldCom scandals, additional disclosure of book-tax differences was suggested and companies with larger book-tax income could have manipulated it. Book tax difference is informative when it comes to earnings quality. According to Joos et al. (2000), firms reporting high book-tax differences are usually associated to positive earnings trend.

Tax avoidance is also linked to managers' incentives: managers have incentives to increase after-tax returns when their benefit depending on income is higher. The association between tax avoidance and required book-tax conformity is less negative when the variable part of management compensation is high. Desai and Dharmapala (2009) find that a greater book-tax conformity should decrease tax avoidance, while Atwood et al. (2012) write that management compensation incentives could mitigate these effects and they find that higher book-tax conformity won't probably reduce tax avoidance if managers' variable compensation is also reduced.

According to Rego and Wilson (2008), tax avoidance is positively associated with management compensation. If the compensation is based on after-tax performance, effective tax rates are lower. Lokken (2006), Mandolfo (2007) and Fleming et el. (2008) find that firms resident in Countries with worldwide tax systems use more sophisticated international tax-planning strategies. Antwood et al. (2012) find the opposite. On average, the worldwide approach leads to less tax avoidance than the territorial approach. This result is the same Markle (2010) finds. In particular, he finds that multinational firms subjected to worldwide approach usually engage less in income shifting than the ones that use territorial approach. Manager incentives are also positively related to tax avoidance.

Desai and Dharmapala (2006) show that the optimal management compensation contract adjusts to offset the effect of sanctions against tax evasion. Managers' tax avoidance decisions may be influenced by their compensation (that includes stocks, stock options etc).

Thanks to the understanding of the impact of tax system, investors can understand better tax information in the financial statements. Some prior research (Rego, 2003, Cazier et al. 2009; Wilson 2009), show that more profitable firms engage more in tax avoidance because they have greater incentive to reduce taxes. Furthermore, tax avoidance is lower for large firms.

1.4 Determinants of tax avoidance

Tax avoidance can be found thanks to different determinants and there are some patterns that we can often find in corporations that are tax avoidant. According to Wilson (2009), there's a positive and significant relations between book-tax differences[1] and tax sheltering. Furthermore, these companies usually have more aggressive reporting practices and more foreign operations. To reduce taxation, they own subsidiaries located in Countries with low corporate tax rates. Aggressive tax planning doesn't mean doing something illegal but acting in the bounds of legality. Nevertheless tax-avoidance measures are putting more and more limits. On the OECD BEPS report, it is written that "a number of indicators show that the tax practices of some multinational companies have become more aggressive over time, raising serious compliance and fairness issues"[2].

According to Desai et al. (2007), tax avoidance depends also on a company's ownership structure. If a firm has concentrated ownership (family business is the main example), it could avoid more taxes because the family members benefit more from profits. At the same time, concentrated ownership firms may pay more taxes because they could fear the impact of repercussions. According to Desai and Dharmapala (2006), family firms usually tend not to avoid taxes. Managerial power is another determinant for tax sheltering (Desai, Dharmapala,

1 Book tax difference has to do with variations between a company's financial accounting income (book income) and the taxable income, reported to tax authorities. These differences depend on different reasons, for example the different recognition timing of revenues and expenses, different accounting methods and the utilization of tax planning strategies like tax shelters (Wilson, 2009).

2 http://ec.europa.eu/competition/antitrust/overview_en.html; accessed January 12, 2011

2006): a higher managerial power can lead to an increase in incentive compensation and decrease in the level of tax sheltering.

When effective tax rate increases, optimal level of investment decreases. This happens because if the cost of tax avoidance increases, firms avoid less taxes and taxes influence more their investment decisions. Tax policy also have real effects on tax base. Results show that investment levels increase if cost of capital investment is deductible.

Taxes affect mainly location decisions when it comes to investments. Hanlon and Heitzman (2010) analyzed the foreign direct investments (FDI) in the U.S. and investments in U.S. entities by foreign taxpayers. Foreign direct investments are defined as a significant investment (more than 10% voting rights) in foreign entities.

When it comes to the location of the investment, we need to mention tax havens. OECD gives this definition: "a jurisdiction that imposes no or only nominal taxes and offers itself as a place to be used by non-residents to escape taxes in their country of residence." (1998) The main Countries that we can give as an example of tax havens are Bermuda, Cayman Islands and Ireland. In the future, firms will likely not be related to a Country anymore, but they will become "global firms" and the taxation rules will be mostly harmonized. Tax avoidance activities influence the cost of capital because they aim to reduce the effective tax rate on investments.

Tax avoidance affects the firm-specific corporate tax rate. If the cost of tax avoidance increases, for example because of some regulations (like OECD BEPS), the firm has less incentives in tax avoidance (Alexander et al., 2020, Buetter et al., 2012).

As studies by Shackelford and Shevlin (2001), Hanlon and Heitzman (2010), and Wilde and Wilson (2018) show, there's a large, growing literature on tax avoidance. Nevertheless, the main problem is that this literature is mainly focused on firm-level determinants (size, profitability, leverage, growth opportunities, financial issues, market strength), management and board characteristics (managerial ability, corporate complexity) or institutional issues (tax rates worldwide, book-tax differences, anti-tax avoidance rules). What the literature is missing is how tax avoidance affects investments. Literature is progressing (Wilde, Wilson, 2018), by also looking at the consequences of tax avoidance, but it is still silent on how tax avoidance shapes investments.

The main point is that some firms take advantage of tax avoidance, but not all of them are prone to this behavior. On the opposite, some companies avoid engaging in this behavior. According to Dyreng (2008), about one-fourth of companies pay taxes more than 35% of their pre-tax income, given a 35% federal corporate tax. For this reason, these companies apparently don't engage in tax avoidance. Many studies have tried to find an answer to this question that was called "under-sheltering puzzle". Tax avoidance activities are sometimes shut down because of reputational costs, in particular the most aggressive ones. Shulman (2009) writes that public has little tolerance for aggressive tax planning. However, we have little empirical evidence on the reputational costs of tax avoidance.

Hanlon and Heitzman (2010) asked themselves the question "Why do some corporations avoid more taxes than others? How do investors, creditors, and consumers perceive corporate tax avoidance?"
The study by Gallemore, Maydew and Thornock (2014) investigates these questions. What they find is that, even if the stock price decreases after the news about tax avoidance, it then reverses to the previous level. Thus, there's a short window effect on stock price, as Hanlon and Slemrod (2009) noticed. Then, no evidence was found related to CEO, CFO or auditor turnover in the next three years. There was no significant change in sales, sales growth or advertising expenses.

Managers trying to boost financial reporting income could have more tax costs to report higher book income. On the other hand, managers that want to minimize income, report lower income to shareholders as well and incur therefore in financial reporting costs (Frank, Lynch, Rego, 2009).
On the contrary, some research highlights that firms sometimes report higher book income to shareholders and lower taxable income to tax authorities. This reflects the fact that companies not always face a trade-off between financial and tax reporting. This happens because tax rules leave firms the opportunity to manage book income upward and taxable income downward in the same reporting period.

According to Frank, Lynch and Rego (2009), "aggressive financial reporting" is defined as "upward earnings" management and "aggressive tax reporting" as downward manipulation of taxable income thanks to tax planning strategies that can or cannot be tax evasion (and therefore illegal). Firms are aggressive if they have high pre-tax accruals (high book-tax difference). The

study concludes that financial and tax reporting aggressiveness are significantly, positively related. The study also finds that the market tends to overprice aggressive tax reporting positions when firms engage in aggressive tax reporting. In conclusion, nonconformity between financial accounting standards and tax law let firms to increase book income and decrease tax income for the same reporting period. Furthermore, investors don't fully incorporate the information in discretionary accruals into stock price.

Shin and Park (2019) study how industry-wide factors, such as product market competition, affect corporate tax avoidance in Korea. The study focuses on the role of corporate governance in the relationship between product market competition and tax avoidance. The study takes a sample of public companies listed on Korea Stock Exchange between 2001 and 2016.
The researchers find that market competition is negatively related to tax avoidance. This means that competitive markets are like external corporate governance mechanisms and lead managers to decrease tax avoidance. Furthermore, firms with more independent board of directors and firms with outside directors as audit committee are found to have a higher negative association between product market competition and tax avoidance. This implies that product market competition is more effective when the firm has strong internal governance mechanism (for example, board independence and audit committee independence).
Income tax expense affects cash outflows: since tax avoidance reduce tax liabilities, corporate cash holdings increase. When there exists information asymmetry between managers and shareholders, divergences could arise. The effect is negative, in particular when marginal costs exceed marginal benefits.

According to Desai et al. (2004) and Desai and Dharmapala (2006), corporate governance affects tax avoidance (both benefits and cots). In widely held corporations (where ownership and management are separated), managers may exploit corporate resources for private gains.
Desai et al. (2004) find that corporate governance is negatively related to tax avoidance. This means that firms with strong corporate governance structure and external shareholders monitoring have high corporate transparency and are therefore less involved in tax avoidance.
Armstrong et al (2012) show that the compensation of a tax director is negatively associated with GAAP effective tax rate.
Furthermore, according to Slemrod (2007), the design of incentive plans could influence corporate tax avoidance, while a negative relationship between top executives' equity-based

compensation and tax avoidance is found by Desai and Dharmapala (2006) and Rego and Wilson (2012).

Goerke and Runkel (2011), in their study, use a Cournot oligopoly model to show that intense competition may have the negative side effect of increasing tax evasion, lowering public revenues and welfare. They find a similar result if marginal production costs fall, and demand is either weakly concave or convex and inelastic. There would be more competition, less evasion and higher public revenues if marginal production costs fall and demand is convex and elastic or demand elasticity increases. The policy implication is that tax enforcement should be intensified if there is a negative trade-off between competition and evasion.

They also show that reducing market power may induce firms to intensify tax evasion activities, thus eroding public revenues and possibly contributing to a decline in social welfare. In such cases, competition policy should be accompanied by a greater effort to fight tax evasion. The key of the paper is that competition policies may have negative side effects that go against the positive impact of increasing competition. The study reveals that tax evasion may substitute market power for companies' point of view. For example, a decline in entry costs intensifies competition and increases output, but, at the same time, it boosts tax evasion and may reduce public revenues. On the opposite, more competition, less tax evasion, and higher public revenues will be obtained by a decrease in marginal production costs, if demand is elastic and by an increase in price elasticity of demand. A basic trade-off between competition and tax evasion is also hold when detection probability negatively depends on number of firms.

Zimmerman (1983) states that bigger firms have less possibility of choice when it comes to tax policies, because they are more controlled and have stricter government regulation than small firms. On the other hand, Porcano (1986) found a negative effect of firm size on ETR. This happens because large firms can more easily involve in lobbying or hire professionals to avoid taxes. Other authors, like Shelvin and Porter (1992) and Manzon and Smith (1994) find that firm size doesn't really influence ETR.

Listed companies likely enjoy tax preferences. Tax preference competition reflects competition among local governments in capital market. Since listed companies provide finance and employment pressure to the economic system, the local government gives often support if the companies share employment pressure and hire more people.

1.5 Consequences of tax avoidance

Tax avoidance can have negative consequences. First, the company may be discovered by authorities and asked to pay additional taxes, or it can be subjected to penalties. Tax avoidance is not only a risk for corporations, but also for governments. In case of tax avoidance, governments face a reduction in tax revenues and therefore less resources (Desai and Dharmapala, 2006).

Hamlon and Slemrod (2008) show that news about tax shelters has usually a negative impact on market price (around -10,4%). Tax avoidance can distort the decision-making process in a company. If managers make decisions according to tax advantage, they may not seek profit maximization (and therefore they would not follow economic efficiency).

According to Hanlon and Heitzman (2010), taxes have real effects on investment decisions, and, in a similar way, tax incentives can influence financial reporting. Real effects refer to tangible impacts that changes in tax policies or tax planning strategies have on a company's outcome. Financial effects are different from real effects because they mainly affect financial statements instead of real outcomes (Jacob, 2021).

Jacob (2021) also writes about real consequences of tax avoidance on investment decisions. They have real effects on this kind of decisions because tax avoidance affects corporate tax rate. If investment costs are not fully tax deductible, capital is a less attractive input. Even if the firm is financed by debt, the same happens because the company may be able to deduct only tax depreciation and not economic depreciation. In conclusion, we can say that tax avoidance lowers tax impact. The study also finds that there's a negative link between optimal level of investment and effective tax rate.

Kubik et al. (2015) also find that tax avoidance strategies can have negative consequences. Firms could have current-period costs for future-period tax benefits that are not realized because of uncertainty of future income.

One of the main reasons why companies choose to avoid taxes, is to increase earnings. Earnings management depend at least on three tax-related items: valuation allowance, tax contingency reserve, foreign earnings designated as permanently reinvested.

According to Jacob (2021), apparently higher corporate tax rates reduce corporate investment, foreign direct investments and innovation. Growth and aggregate output may be reduced because of corporate taxes. On the other hand, there are not many studies analyzing employment effects of corporate taxes and the role of tax base elements in investment decisions. There's not much research on the connection between tax avoidance and real effects on corporate taxation. There's only little evidence, even if the theory is clear (tax avoidance mitigates tax effect on investment). Tax decisions are one of the most important issues in corporate's matters, especially when it comes to investments.

Investment and financing policies, organizational forms, transfer pricing and management compensation are all affected by taxes. Taxes are not the only factor that we should consider, but it's the most important one (Hanlon and Heitzman, 2010). There's a growing interest in tax influence on corporate decisions.

Another issue that a company may consider when engaging in tax avoidance, is the reputational problem. Lately, studies have shown that tax avoidance is more and more common and effective in increasing after-tax earnings. More than a quarter of listed U.S. companies can reduce taxes to less than 20% of their pre-tax earnings (Dyreng, Hanlon, Maydew, 2008).
Corporate tax avoidance could be a legal avoidance or an illegal evasion that results in violation or abuse of tax laws. Legal tax planning is a strategy to lower corporate tax liability and therefore to increase the company's profits. According to Slemrod (2007), Hanlon and Heitzman (2010), tax avoidance has a positive effect on cash flows, but, on the other side, it could have a negative effect on enterprise value, because it decreases credibility of financial reporting and increase the probability of detecting diversion for private gain and therefore it increases future cash flows for tax paid.

Conclusion to chapter one

This first chapter gives an overview on taxation, tax avoidance and tax planning. It takes into consideration corporate tax avoidance, both with determinants and consequences of tax avoidance.

The chapter also explains that one of the factors influencing tax avoidance is competition and this will be then taken up in the later chapters.

Here follows the second chapter, about the second macro-theme of this work: product market competition. The second chapter deals with this topic and explains how the two issues are connected.

Chapter 2: product market competition and tax planning

Introduction to chapter two

Since companies don't operate in monopolies, but must face competition, market competition is an important issue when it comes to decision-making processes.
A competitive market is a abstract place where many companies are located and compete one with another. In a competitive market no one has the strongest power and can dictate the whole market.

Competition should be taken inot consideration when talking about tax decisions.
Besides that, market power bring with itself other consequences, for example profitability (which is constant and smoother) or leverage ratio (which is higher in case of firms with higher market power). Generally, many studies state that higher market power means that companies have a greater capability to absorb negative shocks by increasing prices. Moreover these companies have more predictable earnings and therefore more stability in the future.
The main part of the chapter is about product market power and tax avoidance. Many studies are here taken into consideration and the results are quite different from one another.
Generally, product market power leads to advantages in taxation because the higher the presence of the company in the market, the higher the possibility of involvig in strategies such as lobbying or simply hiring experts that help the company to avoid more taxes.
Paragraph 2.3 focuses on a slightly different issue, always regarding product market competition: earnings management and, specifically, on how intense competition can drive managers to improve firm value.

2.1 Product market competition: a general overview

Since firms usually do not operate in monopolies, market competition is an important issue when it comes to economic and financial decisions, in different scenarios.

Market power is "the ability of a firm to determine the price, quality and nature of a product in the marketplace" (Shepherd, 1970). Greater market power means less competitive threats. Lerner (1934) identifies the social loss from product market power as the difference between price and marginal cost. Furthermore, we should take into consideration the competitors also when we think about tax decisions. Competition refers to different companies operating in the same industry or sector where each of them wants to capture the biggest market share possible. One of the most important dimensions of competition is product's market.

Jiang et al. (2015) study the relationship between product market competition and corporate investment in China. They find that product market competition and corporate investment have a positive association. One standard deviation increase in PMC increases corporate investments by 2,65%. Investment efficiency has been studied by Stoughton et al. (2017). The study finds that investment inefficiency is positively related to competition. A one standard-deviation increase in HH index decreases investment efficiency from 5 to 10%. Product market competition affects earning quality as well. Cheng et al. (2013) document a positive association between earnings quality and product market competition. Moreover, firms operating in concentrated and heterogeneous industries have lower level of earnings quality. Dhaliwal et al. (2014) state that there's a robust positive relation between product market competition and conditional accounting conservatism. When the threat of new entrants and existing competition are higher, conditional conservatism is bigger. These results hold for industry followers more than industry leaders. Moreover, firms having dominant pricing power or facing lower competition usually don't engage in accrual management (Datta et al., 2013). According to Datta et al. (2013), one standard deviation change in product market pricing power from median value increases discretionary accruals. Yan et al. (2016) write that the amount of narrative risk disclosure is more (less) by firms operating in less (more) competitive industries, but the risk disclosure exhibits more similarity with their rivals.

If the market power is high, profitability is usually constant and smoother. According to Hoberg, Phillips and Prabhala (2014), if a firm has greater product market power, it can take

more risky behaviors (for example, maintaining higher leverage). The ratio behind is that firms with product market power have more resilience when it comes to negative shocks. On the opposite, firms with little product market power usually act like followers in the market. For this reason, product market power can be one of the factors leading to tax avoidance and tax planning. Firms with product market power, for example, can better overcome a negative cash flow shock. With greater market power their profits are less risky, the expected returns are lower and stock prices more informative (Hou, Robinson 2006). Moreover, firms with higher market power usually have higher leverage ratio compared to other firms because their cash flows are less risky (MacKay and Philips, 2005) and they also invest more in research and development (Khanna and Iansiti, 1997).

Kubick, Lynch, Mayberry and Omer (2015) studied the relationship between market competition, tax avoidance measures and stock market outcomes. They took 25800 firm year observations from 1993 to 2010. They measured product market power using the excess price-cost margin. PCM is equal to each firm adjusted price-to cost margin, which can be computed as the ratio of a firm's sales less cost of goods sold, less selling, general and administrative expenses to sales. They find a positive correlation between product market power and tax avoidance measures.

Firms with greater product market power can absorb better negative shocks by increasing prices. Moreover, this firms have more predictable earnings if we compare them to more competitive industries. This stability helps managers to forecast future income and make it more likely to have future tax benefits. Product market power can be a reason for firms to engage in tax planning strategies and, therefore, tax avoidance.

Ilhang Shin and Sorah Park (2019) study the effects of product market competition on corporate tax avoidance In Korea. They find that product market competition has a negative relation with tax avoidance. Competitive markets make managers decreasing tax avoidance. Furthermore, firms with more independent board of directors or internal audit committee have a more negative association with product market competition. There's a complementary relationship between internal governance and product market competition.

2.2 Tax avoidance and product market competition

European Commission states that competition is the basic mechanism of market economy that makes companies providing products that consumers want. Thanks to competition, there's more innovation and prices are pushed down. Suppliers who are independent from each other are subjected to competitive pressure.

Kubik et al (2015) first examined if product market leader's success leads to incentives for other firms to avoid taxes. They start from the idea that, thanks to product market power, firms have barrier against competitive threats and, they have more opportunities and incentives to be involved in tax avoidance. According to Hou and Robinson (2006); Irvine and Pontiff (2009); Peress (2010), firms with high market power have a smoother profitability. Firms with higher product market power can more easily project the effects of tax avoidance (Mayberry, McGuire and Omer, 2013). When a firm has more power in the market, it can better overcome negative outcomes and it can be involved in riskier competitive behaviors without having very negative consequences (Peress, 2010).
Peress (2010) links investors' trading behavior to market competition. The model is a standard expectations model of trading under asymmetric information, but with a peculiarity: firms act like they were in a monopoly, so that they can survive shocks. The study shows that firms with higher market power have higher trading volume and information content of stock prices. Therefore, product market deregulation has implications that influence equity markets as well.

Davis and Greve (1997) and Chua and Petty (1999) found that sometimes firms mimic tax avoidance of other firms. Then the same authors tried to understand if product market power and tax avoidance is considered important by investors. They investigate the value implications of tax avoidance because some research explains that firms with great market power have lower expected returns and more informative share prices. These firms bare lower risk and have fewer volatile cash flows and earnings.
To do so, they measure product market power as industry adjusted, firm specific price-cost margin. The measure "price-cost margin" defines how price is higher than marginal cost. If product market power is positive, the firm is not in a purely competitive scenario because otherwise economic profits would be zero and prices equal to marginal costs. The other variable is effective tax rate (ETR), that is computed as the ratio of total tax expenses to pretax book income, exept special items.

What emerged from the research is that price-cost margins are negatively related to book and cash effective tax rate values. We can therefore understand that product market power is positively related to tax avoidance and, using easier words, firms with higher power (and usually they are the biggest ones) imply more in tax avoidance than others.
The study finds that investors usually accept lower returns from firms with higher product market power because they are usually less risky but are less willing to do so if they are employed in tax avoidance. Knowing how product market power influences firms' tax avoidance is important because, in this way, we can have additional information on the broader industrial organization contexts and how the context influences firm-level behavior. Then, we can see that tax regulators who target recognized product market leaders with enforcement actions could have increased revenues from a decrease in tax avoidance.
Firms with higher market power are the ones that usually engage in tax avoidance, but the study finds also that smaller firms mimic tax avoidance of their product market leaders.
McGuire, Omer and Wilde (2014) find that firms with high operating uncertainty usually don't engage in tax sheltering, apparently because they don't have much flexibility and they have few resources and prefer to exploit other investment opportunities.

Cai and Liu (2009) analyze the effect of competition on tax avoidance in the Chinese market. They look at a large dataset of firms to find how market competition affects tax saving. Their main contribution is presenting evidence that, in China, product market competition increases tax avoidance.
Intuitively, firms with higher competition pressure would avoid more taxes just because they have more investment money. The main challenge they must face is that accounting income is not observable and they have to use proxies for taxable income.

Analysts usually use book income as a proxy for real profits and book-tax gap is taken to measure tax avoidance as Desai (2003; 2005) and Desai and Dharmapala (2006) do. The corporate profits can differ a lot from accounting profits, based on GAAP (General Accepted Accounting Principles). One of the main reasons is the difference in revenue and expense recognition rules. Not all gross output of the year is converted in gross input. Shleifer (2004) points out that competition leads to the spread of some bad behaviors, such as child labor or earnings manipulation. For these reasons, competition may lead to social non-desirable results.

Devereux, Lockwood, Redoano (2008) investigate the competition of OECD Countries over corporation taxes and if competition can explain the decrease in statutory tax rates in 1980s and 1990s. They find that Countries compete on both measures and that there's strategic interaction only in open economies. The decrease in equilibrium tax rate is also due to less capital controls.

To sum up, firms in more competitive industries report less profits for each unit of input to save tax. By the way, there could be another possibility, namely a firm in competitive environment could struggle in converting imputed profits into accounting profits. Cai and Liu (2009) control for all potential factors and they find that firms in competitive industries may find it more difficult to transform imputed profits into accounting profits.
Another input the researchers find is that firms with weaker managerial incentives make managers most probably engage in tax avoidance activities.

In the study by Goerke and Runkel (2011), a Cournot oligopoly is used to show that intense competition may increase tax evasion, lowering public income. If there's a negative trade-off between competition and evasion, tax enforcement should be intensified. Furthermore, a decrease in market power may intensify tax planning, leading to a decline in social welfare.

Conditional conservatism influences product market competition in a strategic way.
The relationship between product market competition and conditional conservatism is influenced by strategic considerations. This argument asserts that in determining its financial reporting practices, a firm considers the potential impact on its competitive stance. For instance, firms operating in industries characterized by low barriers to entry may benefit from the timely recognition of losses, as this can serve to dissuade new entrants from penetrating the market. Similarly, firms that encounter significant competition from existing rivals might expedite the recognition of losses to discourage excessive production by competitors or to encourage their under-production (Clinch and Verrecchia 1997; Li 2010).

According to Dhaliwal, Huang, Khurana and Pereira (2014), an alternative perspective suggests that competition can reduce conflicts of interest between managers and shareholders. According to this view, the presence of competing firms provides benchmarks that facilitate better evaluation of managerial performance. Intense competition also decreases managerial slack, compelling managers to enhance firm efficiency. Thus, product market competition mitigates managerial slack, improves monitoring, and aligns the interests of managers and shareholders. Consequently, the demand for conditional conservatism as a monitoring mechanism

diminishes. However, this perspective has a limitation in its narrow focus on the benefits of competition in lowering agency conflicts, while overlooking potential costs, such as the high expense of violating existing contracts due to reduced firm slack. Additionally, it neglects the potential advantages shareholders may gain from a firm's monopolistic position.

Additional arguments address the relationship between competition and conditional conservatism. For example, "monopolists face greater political costs than firms in competitive industries" (Watts and Zimmerman, 1986). Consequently, dominant firms in less competitive industries have a stronger incentive to recognize losses in a timely manner to avoid regulatory scrutiny. Furthermore, an empirical relationship between competition and conditional conservatism may emerge due to the "errors-in-variables problem in tests of conditional conservatism" caused by monopoly rents (Ball and Shivakumar, 2006; Roychowdhury and Watts, 2007). Specifically, while monopoly rents are embedded in stock returns, they may not be fully reflected in a firm's earnings, potentially influencing the evaluated relationship. These issues are considered in our empirical analysis.

Porter (1980) differentiates between two dimensions of product market competition: competition from potential entrants and competition from existing rivals.

With regard to conditional conservatism, one should consider its role as a barrier to entry. Recognizing that the entry of new firms undermines its competitive position, a firm may promptly acknowledge adverse news to deter new entrants into the industry (Darrough and Stoughton, 1990). Given that competitors' investments are sunk costs, a firm's objective includes inducing a reduction in its rivals' production output (Clinch and Verrecchia, 1997).

Another line of inquiry posits that product market competition functions as an informal governance mechanism that constrains managers from engaging in actions detrimental to shareholder interests. This literature identifies two causal pathways. First, intense competition can diminish managerial slack and compel managers to enhance firm efficiency (Alchian, 1950; Stigler, 1958). In support of this argument, Nickell (1996) demonstrates that competition, as measured by an increased number of competitors or reduced levels of monopoly rents, is associated with a significantly higher rate of total factor productivity growth. Second, intense competition can facilitate more effective monitoring of managers (Holmstrom, 1982; Nalebuff and Stiglitz, 1983; Hart, 1983). In competitive markets, the profits of other firms can be observed and utilized as benchmarks for assessing managerial performance.

According to what Porter (1980) writes, every firm within an industry has a competitive strategy, whether explicitly designed or implicitly developed. This strategy might be explicitly created through a structured planning process or implicitly shaped by the actions of various functional departments. If left unchecked, each department will inevitably pursue strategies dictated by its professional orientation and the incentives of its leaders. However, the aggregate of these departmental strategies rarely constitutes the optimal approach for the firm.

The growing emphasis on strategic planning in firms, both in the United States and internationally, highlights the significant benefits of an explicit strategy formulation process. This process ensures that the policies, if not the actions, of functional departments are coordinated and aligned towards common goals. The focus on formal strategic planning has brought attention to longstanding managerial concerns: What drives competition in my industry or in industries I am considering entering? What actions are competitors likely to take, and what is the optimal response? How will my industry evolve? How can the firm best position itself for long-term competitive advantage?

According to Dhaliwal, Huang, Khurana and Pereira (2014), there's positive association between intense product market competition and conditional conservatism. This relationship persists when differentiating between competition from potential entrants and competition from existing rivals. Additionally, they provide time-series evidence supporting the relationship between product market competition and conditional conservatism, observing an increase in conditional conservatism following deregulation and during periods of heightened antitrust enforcement. They further investigate whether the effects of product market competition vary among firms within the same industry based on their market share. The findings indicate that the positive relationship between product market competition and asymmetric timely loss recognition is significant for industry followers but not for industry leaders. Moreover, evidence indicates that firms adopt conservatism to enhance their competitive position amid intense product market competition from both existing rivals and potential entrants. This strategic consideration view is further supported by the observation that the positive competition-conservatism relationship predominantly applies to industry followers, i.e., firms more vulnerable to competitive pressures.

Kubik et al. (2015) state that firms operate in a competitive environment, continually vying to capture consumer market share and maximize profits. A key dimension of this competition is the product market. Although nearly all firms face some level of competition, the industrial

organization literature has long recognized that certain firms possess a greater ability to influence the price, quality, and characteristics of their products—a trait referred to as product market power (Shepherd, 1970).

Product market power offers firms a degree of insulation from competitive threats, thereby providing broader opportunities and potentially greater incentives for tax avoidance. First, product market power enables firms to achieve higher, more stable, and more persistent profitability (Hou and Robinson, 2006; Irvine and Pontiff, 2009; Peress, 2010). Additionally, evidence suggests that firms with smoother or more persistent earnings, such as those with higher degrees of product market power, are better positioned to forecast and realize the benefits of tax avoidance (Mayberry, McGuire, and Omer, 2013). Product market power is furthermore expected to alleviate concerns about unsuccessful tax avoidance, as the costs associated with failed tax avoidance efforts are less likely to undermine a firm's ability to sustain its competitive position. Consequently, product market power serves as a natural hedge against economic shocks, providing insulation from competitive threats and thereby supporting increased tax avoidance among leading firms in the product market.

Kubick et al. find that firms' tax avoidance is more strongly associated with the industry average tax avoidance than with the tax avoidance strategies of product market leaders. This outcome suggests that firms primarily use the industry average as their benchmark, while also considering the tax practices of product market leaders as a relevant secondary benchmark. Due to the difficulty in distinguishing the effects of mimicking the industry average from those of mean-reversion, we interpret the results concerning the industry average with caution. Unlike mimicry, mean-reversion is a natural process that requires minimal effort. Thus, the fact that firms mimic the tax outcomes of product market leaders, even though this influence is smaller than that of the industry average, is still informative. This is because, unlike the industry average, the tax avoidance practices of product market leaders are less likely to be confounded by mean-reversion effects.

A negative relationship is found between firms' product market power and the average absolute cumulative abnormal returns surrounding earnings announcement dates during the most recent fiscal year. This result aligns with Peress' (2010) finding that firms with greater product market power, which provides a built-in hedge against adverse outcomes and makes their profits less risky, have more informative stock prices because risk-averse investors are more willing to hold and trade shares of these firms. Additionally, the interaction between cash tax avoidance and

product market power (PCM) is positive in these regressions, suggesting that the difficulty in evaluating relatively higher cash tax avoidance diminishes the allocative efficiencies of product market power as demonstrated in prior research (Peress, 2010).

Product market power serves as a natural hedge for firms' non-operating decisions, enabling firms with significant market power to engage in greater tax avoidance. Firms with product market power can better absorb negative shocks by increasing prices, whereas firms with minimal market power are more accurately described as "price takers." This ability to offset negative profitability shocks through higher product prices leads to smoother and more predictable earnings compared to firms in more competitive industries (Hou and Robinson, 2006; Irvine and Pontiff, 2009; Peress, 2010). Consequently, product market power may provide greater incentives for firms to identify and implement tax planning strategies.

Smooth taxable income improves the accuracy of managers' forecasts about future taxable income, thereby increasing the likelihood of realizing future tax benefits and facilitating a better assessment of whether a particular tax avoidance strategy will yield a positive net present value (Mayberry et al., 2013). For example, firms are less likely to incur the costs associated with implementing an income-shifting strategy if the probability of future income is low or if the volatility of future taxable income hampers the ability to estimate future tax savings. The low probability of realizing future income influences the current-period decision to engage in tax avoidance.

Economic theory posits that in purely competitive markets, product prices equal marginal costs. A firm's ability to set prices above marginal costs indicates product market power and reduced competitive threats (Lerner, 1934; Gaspar & Massa, 2006; Peress, 2010). In line with prior literature (Gaspar & Massa, 2006; Peress, 2010), we measure a firm's product market power using its excess price-cost margin (PCM). PCM is specifically calculated as the industry-adjusted price-cost margin, defined as the ratio of a firm's sales (Compustat SALE) minus the cost of goods sold (Compustat COGS) and selling, general, and administrative expenses (Compustat XSGA) to its sales (Compustat SALE).

2.3 Product market competition and earnings management: A firm-level analysis

According to Zhang, Jianfei, Shi (2017), intense competition can drive managers to improve firm value and enhance social efficiency. However, recent studies indicate that competition may also lead managers to take excessive risks and engage in unethical practices.

Competition can influence managerial behavior in two opposing ways. Managers can improve performance thanks to insight into their peers' performance and increasing likely dismissal, firm liquidation and takeovers (see Fama, 1980; Giroud & Mueller, 2011; Grullon & Michaely, 2007; Holmstrom, 1999; Tang, 2017).

On the other hand, competitive pressure can drive managers to manipulate financial results to decrease the threats of dismissal, firm liquidation and takeovers, or to improve their financing opportunities and conditions. (e.g. Bergstresser & Philippon, 2006; Dechow, Sloan, & Sweeney, 1996; Markarian & Santalo, 2014; Morellec, Nikolov, & Zucchi, 2013; Teoh, Welch, & Wong, 1998).

Market valuation through earnings management can lead reported profits to wrongly reflect the firm's productivity and also harm the firm's long-term value. Consequently, earnings management can result in distorted investment decisions and inefficient resource allocation within the economy.

Zhang, Jianfei and Shi (2017) state that increased competitive pressure leads managers to misstate earnings due to career-related incentives. Furthermore, they propose that real earnings management diminishes as competitive pressure intensifies. Although firms can engage in real activities manipulation to influence reported earnings, like discretionary accruals, such manipulation incurs substantial costs under intense competitive conditions. Real earnings management leads to operational and investment decisions that may impair a firm's competitive advantage. For instance, a firm might reduce its advertising or research and development (R&D) expenditures to temporarily inflate reported earnings. However, since these expenditures are critical investments for the company's growth, they can be problematic, especially if the firm's products risk rapid obsolescence or substitution because of competition. Consequently, the costs associated with real earnings management increase with market competition, leading firms under significant competitive pressure to avoid real activities manipulation.

Firms experiencing heightened competitive pressure are more prone to engaging in actions deemed by the Securities and Exchange Commission (SEC) as significant violations of generally accepted accounting principles (GAAP) and are more likely to face shareholder litigation. This finding suggests that the positive correlation between competition and the misrepresentation of financial reports is not solely attributable to unintentional errors.

Moreover, we observe a negative correlation between competitive pressure and real activities manipulation. This finding is coherent with the prediction that competition makes real earnings management prohibitively costly, leading firms under intense competitive pressure to avoid such manipulative practices.

Gerety and Lehn (1997) state that external market forces have a more significant impact on corporate behaviors, such as earnings management, than internal firm structures.

Balakrishnan and Cohen (2013) find that competitive pressures enforce stricter discipline on earnings quality. Meanwhile, Karuna et al. (2012) and Markarian and Santalo (2014) observe that managers' incentives are increased by industry-level competition for both accrual-based and real earnings management. In contrast, Zang (2012) argues that within an industry, competition increases the costs of real earnings management for less competitive firms. Zang's research shows that market leaders are more likely to engage in real earnings management, whereas non-market leaders tend to rely more on accrual-based earnings management.

Narayanan (1985) states that top executives may try to enhance short-term performance when they are concerned about their reputation in the labor market. Karaoglu, Sandino, and Beatty (2006) provide evidence that relative performance evaluations in competitive industries can incentivize managers to manipulate earnings to align with fraudulent practices of competing firms. Similarly, Markarian and Santalo (2014) present evidence supporting the notion that relative performance pressures drive accounting manipulations.

In their research, Zhang, Sun and Shi (2017) utilize a firm-level measure of competition pressure to investigate how product market competition influences managers' incentives to manage earnings. Unlike previous research that typically relies on industry-level competition metrics, their measure captures both industry-wide competitive characteristics and intra-industry variations. Their analysis reveals that firms experiencing higher levels of competition pressure are more likely to exhibit accounting irregularities, engage in accrual-based earnings management, and face shareholder lawsuits. They identify a negative relationship between

competition pressure and real earnings management, suggesting that competition increases the cost of real earnings management, leading firms under intense competitive pressure to avoid such practices. While existing literature often views competition as a force that enhances firm efficiency and social welfare, recent studies have explored its adverse effects, particularly on managerial behavior under competitive pressure. This study contributes to the literature by providing new evidence on how competition pressure impacts managers' financial reporting behaviors, thereby offering fresh insights into agency problems across varying competitive environments.

Conclusion to chapter two

This second chapter has described how product market power has become more and more important for strategies inside a company and how it's involved in firms' decisions. Even though competition is not perfect – as the perfect market would request, with marginal cost equal to price-, markets are more and more competitive and companies in the market tend more, for example, to follow rules set by various commissions.

Chapter 3: tax regulation and corporate taxation in Europe

Introduction to chapter three

This Chapter is a bit different from the others because it's more about regulations, related to taxation in the European Union and, specifically, how rules could be harmonized so that Countries could follow the same ones and double taxation could be avoided and profit shifting lowered.
Since taxation can also be seen as a distortion of profits, lowering or harmoizing the tax rate could lead also closer to perfect competition.

As seen from the table, also the withholding tax is very different from one Country to another.

Then paragraph 3.3 is about multinational profit shifting and the reasons why companies involve in this practice. The goal is shifting profits from the Country with higher tax rate to the one with the lower rate. This is possible because, once again, Countries have different taxation systems.

The Chapter is also about competition over corporate taxes, showing how corporate tax rates have generally decreased over the years, while tax base has generally increased. It's also very clear that there are significant differences over Countries, also inside European Union.

3.1 Tax enforcement and regulations

Alexander et al (2020) analyze which role tax enforcement plays when it comes to profit shifting. The initial hypothesis is that tax enforcement increases the strength of tax rules. As tax enforcement becomes stricter, multinational affiliates transfer less income to the parent company.

Taxation of companies has become more and more complicated since many of them are nowadays multinational companies. Many companies use strategies to avoid paying high taxes, reducing tax liabilities. This is a problem for fair competition in the market. After the financial crisis, the OECD launched the BEPS (base erosion profit shifting). The project was completed in October 2015.

From what we can read on European Commission website[3], the Anti-Tax Avoidance Directive is aimed at fighting tax avoidance and improve the functioning of internal market. The ratio behind the directive is having a harmonized approach against tax abuse in all European Union. Taxpayers sometimes act against the purpose of the law, exploiting the differences between national tax rates.

The "Code of Conduct for Business Taxation" was created in 1998 to fight against tax competition among Europe. In 2009, the Code Group started indagating anti-abuse issues linked to mismatches. The work was concentrated on hybrid entities and hybrid permanent establishments. Each Member State would have to change the qualification of the hybrid entity from transparent to non-transparent in case of double deduction.

3.2 Corporate tax harmonization in Europe

Even if the goal of harmonization seems to be reducing the economic distortions in capital markets, the focus of corporate tax consolidation is reducing compliance and administrative burdens. In Canada, every province can decide its corporate tax policies and effective tax rate but all decisions should be harmonized. European union should also think about a consolidated tax base for companies (Mintz, 2004). Many critics report that, on the opposite, tax competition is helpful for limiting taxing power of governments or developing tax policies that are closer to national objectives. By the way, corporate tax system is far from reducing tax competition and

[3] https://commission.europa.eu/index_en

distortion in the market. Even if there's consolidation of corporate tax bases across sub-national jurisdictions, distortions in effective tax rates are common.

What consolidation really aims at is making the corporate tax system a highly integrated market that works better and is easier for governments to control.

According to Mintz (2004), there are two main reasons to introduce corporate income tax in Europe.

First, if governments tax capital income at personal level, that income is subjected to corporate income tax before distribution to investors.

Second, according to foreign tax crediting rules, only corporate income tax is creditable against foreign tax liabilities. The elimination of corporate income tax would result in a transfer of tax revenue from the host to the home country.

The best way to keep corporate income tax as a source-based tax and move to a coordinated system, is enhancing a consolidated tax base. The reform would reduce the compliance and administrative costs of corporate taxation. Home state taxation can be more difficult since each Country would decide its tax system and it would be more difficult to find a common rule.

According to European Commission (2015), the single market of the European Union should enable businesses to source, produce and sell anywhere without the problem of double taxation and tax discrimination. Furthermore, tax competition should be avoided. Because of this, European Commission has proposed different ways to align corporate taxes in EU. The European Commission proposed in 2001 a Common Consolidated Corporate Tax Base for European companies. The common base would have to be respected by Member States, that would then decide their own corporate tax rate. This rule was, by the way, never applied. European Union has experienced unification of monetary and exchange rate policies and introduction of single currency by 12 Member States.

By the way, in contrast to the US, EU doesn't have a federal government with real taxing powers and financial leverage and therefore it cannot mitigate opposite effects that may arise from Member States tax policies. Different tax policies can have spillovers or externalities effects, both positive and negative on other Member States. Moreover, different taxing rules increase administrative and compliance complexity and costs. The main difference between EU (which is said to be a contour of a confederation, Staatenbund) and US (federation, Bundesstaat) is the power to tax. In EU, Member States have this power, while in the US federal government decides taxing rules, that are common for all federal states.

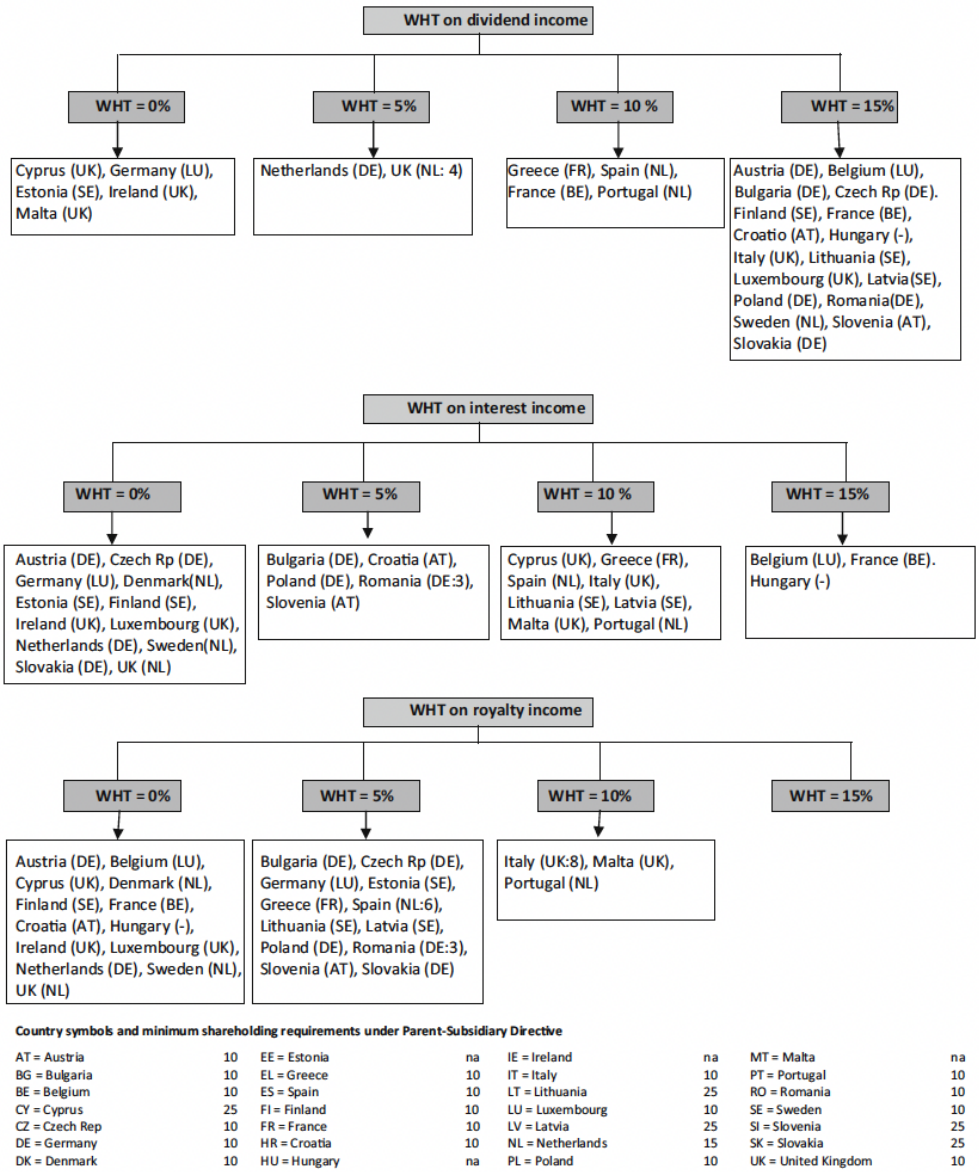
Before financial crisis, EU corporate tax policy makers used to focus on eliminating fiscal barriers, while later on provisions on transparency were adopted. Over the past decade,

corporate taxation in Europe has changed a lot. The main goals were improving the efficiency of corporate tax system and get rid of barriers, in order to stimulate trade and investments in the EU.
According to Roland (2020), since 2008 crisis, harmful tax competition, tax evasion and tax avoidance have been taken more and more into consideration.

Already at the beginning of European Community, it was clear that there should be some form of tax harmonization to achieve an economic union. The Treaty on the functioning of the European Union (TFEU) includes legal basis for the harmonization of indirect taxes (for example turnover taxes). By the way, direct taxes are not included in the Treaty. A harmonization of direct taxes is impossible without member state support and no progress could be made. With the European Single Act (1985), there was an acceleration of European integration process. Negotiations focused on the enhancement of the single market and the protection of fundamental freedoms included in the EU treaties. One of the challenges for the completion of internal market was distortionary effects of harmful competition. According to Hinnekens (1997), one of the methods proposed was the harmonization of corporate tax systems in EU.

According to Devereux (2003), the main policy goal is the removal of company tax obstacles to cross-border activity to promote an integrated single market in Europe. The main goal would be calculating EU-wide profits under a consolidated tax base allocated among member states according to common rules. This would eliminate the separation of accounting based on arm's length principle for individual companies in a multinational group. Different national tax systems would still coexist, but the EU-wide activity multinationals would have to deal with the tax code of their home country.
Public funds can sometimes be used inefficiently, but can tax competition be the solution to this problem? For sure tax competition leads to cuts in public spending, but how can we know that these cuts would be efficiently divided? According to Sørensen (2004), normative for tax competition wouldn't probably be the most effective method to avoid public sector inefficiency.

Table 4 European Union: treaty withholding tax (WHT) rates in 2017 on dividend, interest and royalty payments to non-related parties in member states providing the largest amount of foreign direct investment during 2008–2014



Country symbols and minimum shareholding requirements under Parent-Subsidiary Directive

AT = Austria	10	EE = Estonia	na	IE = Ireland	na	MT = Malta	na
BG = Bulgaria	10	EL = Greece	10	IT = Italy	10	PT = Portugal	10
BE = Belgium	10	ES = Spain	10	LT = Lithuania	25	RO = Romania	10
CY = Cyprus	25	FI = Finland	10	LU = Luxembourg	10	SE = Sweden	10
CZ = Czech Rep	10	FR = France	10	LV = Latvia	25	SI = Slovenia	25
DE = Germany	10	HR = Croatia	10	NL = Netherlands	15	SK = Slovakia	25
DK = Denmark	10	HU = Hungary	na	PL = Poland	10	UK = United Kingdom	10

Sources: Ernst & Young (2017a, b) and OECD (2014). Statistics on foreign direct investment flows are not available for Bulgaria, Cyprus, Croatia, Latvia, Lithuania, Malta and Romania. In the event, the WHT rates on dividend, interest and royalty payments to share, debt and patent holders in the most likely FDI-providing Member States have been inserted in the table. "UK (NL:4)" means that the WHT on dividend income paid by a UK company to a portfolio shareholder in the Netherlands is 4% instead of 5% (the headline rate). Mutatis mutandis the same applies to "Romania (DE:3)" (twice), "Spain (NL:6)" and "Italy (UK:8)"

3.3 Multinational profit shifting

In the last years, thanks to globalization, firms are becoming more and more international and have many affiliates in different countries. Linked to this, the incentive for multinational companies to engage in profit-shifting has increased as well (Heckemeyer and Overesch 2017). The goal is shifting the taxable profits from the Country with higher tax rate to the Country with lower tax rate.

Dharmapala (2014) studies how BEPS (base erosion profit shifting) influences income shifting. Taxation of multinational corporations has become an important issue for policy makers. The G20 declared that they need to prevent base erosion and profit shifting. BEPS includes the main European regulations on tax avoidance. It "refers to tax planning strategies used by multinational enterprises that exploit tax gaps and mismatches in tax rules to avoid paying taxes.

Alexander et al. (2020) focus their attention on multinational investment decisions and, in particular, on profit shifting. They study whether tax reforms implemented across Europe have changed the way companies decide on profit shifting strategies. The study investigates which tax strategies multinational companies implement and how policy makers act to prevent these strategies. The modality takes into consideration not only the changes in tax rate, but also changes in different tax base to understand the size of profit shifting. What they find is that multinationals shift profits into foreign subsidiaries if the tax rate of the host country decreases. If the contrary happens, there will be an opposite behavior.

According to Dischinger, Knoll and Riedel (2014), multinational enterprises would prefer to shift profits from the affiliate with higher corporate tax rate to the one with lower corporate tax rate. The degree to which firms engage in profit shifting behavior depends on the location of the headquarter. Multinational don't really shift profits away from their headquarters, even if it's in a high-tax Country. On the other side, profit shifting activities between parents and subsidiaries are larger if the parent observes a lower corporate tax rate than its subsidiary. The profit shifting incentive is determined by the difference in statutory corporate tax rates of parents and subsidiaries.
With the spread of multinational firms, policy makers and researchers have studied more and more multinational tax planning strategies, which include the profit shifting method from high-tax to low-tax economies by using transfer pricing. Dischinger, Knoll and Riedel (2014) show that profit shifting is not homogeneous across Europe and multinationals are not always

willing to shift profits away from their headquarters, even if they are in high-tax Countries. This means that hosting multinational headquarters helps hedging high-tax Countries against large profit outflows. For this reason, Countries should consider fostering the location of headquarter firms as an ant shifting measure (as well as transfer pricing or thin-capitalization rules).

High-tax jurisdictions experience significant revenue losses because of profit shifting, as noted by Clausing (2003), Devereux and Maffini (2007), Buettner and Wamser (2007), and Dischinger and Riedel (2011). For instance, Huizinga and Laeven (2008) demonstrate that, based on a sample of European multinationals from 1999, Germany—then the European country with the highest corporate tax rate—would have seen a 14% increase in its corporate tax base had profit shifting incentives been absent. However, there remains limited understanding regarding which specific companies engage in profit shifting. Most studies typically assume that shifting behavior is uniform across firms. A notable exception is a smaller body of literature suggesting that intra-firm transfer pricing for firm-specific R&D, innovations, and patent rights—often less visible to tax authorities—tends to exhibit significant distortions, particularly among R&D-intensive firms (see, for example, Grubert 2003; Overesch and Schreiber 2010).

According to Dischinger, Knoll, Riedel (2014), multinational companies generally avoid shifting profits away from their headquarters, even when those headquarters are situated in high-tax countries. Specifically, profit shifting tends to be more pronounced when the parent company is located in a lower-tax jurisdiction compared to its subsidiaries, leading to profits being transferred to the parent. Conversely, if the parent company is in a high-tax country, the amount of income shifted away from it is considerably reduced.

Their analysis introduces a straightforward theoretical model to support the empirical estimation strategy. Under standard assumptions, multinational enterprises (MNEs) have an incentive to shift profits from subsidiaries with higher tax rates to those with lower tax rates. The size and sensitivity of profit shifting in response to changes in the tax rate differential remain symmetric, regardless of the direction of the profit flow. If the parent is located in an high-tax Country, income shifting is considerably smaller.

This outcome is modified when accounting for the empirically observed bias in the allocation of profits and profitable assets favoring the headquarters firm (see Dischinger et al. 2013).

According to the corporate finance literature, such a headquarters bias may arise because managers prefer to retain control over funds and valuable assets at their home location and may be reluctant to transfer them to foreign affiliates. Hierarchical structures often result in headquarters managers having greater influence in internal disputes over organizational funds, leading to a tendency for funds to remain with the parent firm (see, for example, Rajan et al. 2000 and Stein 2003). Additionally, a headquarters bias might develop in response to tax regulations, such as strategies aimed at avoiding taxes on repatriated profits from subsidiaries. Regardless of its origins, this bias suggests that the costs of profit shifting are asymmetric, with relocating profits from headquarters to a subsidiary being more costly than moving income from a subsidiary to the headquarters. Consequently, profit shifting activities are expected to be more responsive to changes in the tax rate differential when profits are moving from the subsidiary to the headquarters. Multinational enterprises (MNEs) seem to actively shift profits from high-tax subsidiaries to low-tax parent companies, while they are generally hesitant to move profits from high-tax parent companies to low-tax affiliates. This interpretation is supported and reinforced by a series of sensitivity analyses.

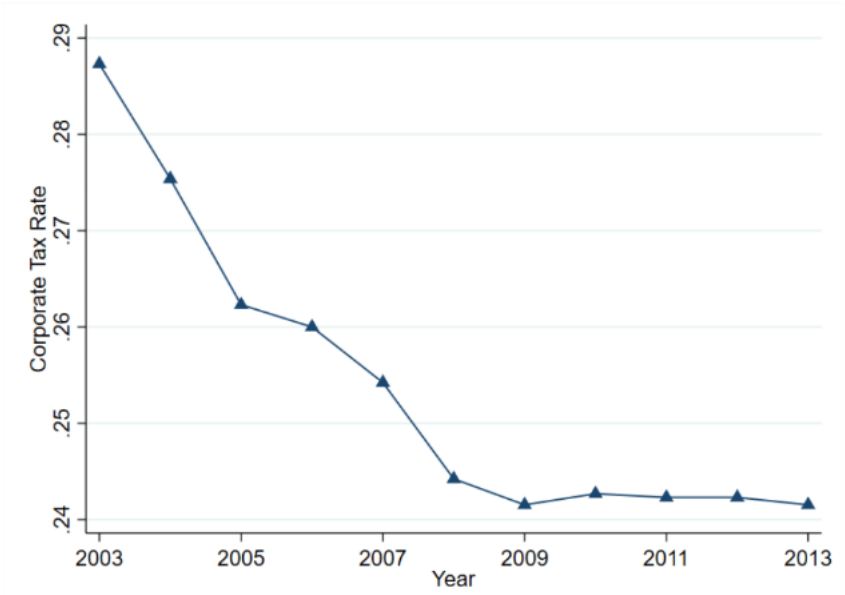
Dischinger, Knoll, Riedel (2014) show that profit shifting behavior varies across multinational enterprises (MNEs) and is not uniform. Specifically, MNEs exhibit a reluctance to transfer profits away from their headquarters, even when these are located in high-tax countries. Consequently, profit shifting volumes between parent companies and subsidiaries are substantial when parent firms have lower corporate tax rates than their subsidiaries, leading to profits being directed towards the parent firm. In contrast, profit shifting volumes are relatively small when shifting profits away from high-tax parent companies. Quantitatively, the findings indicate that profit shifting—measured by the sensitivity of profits to changes in the tax rate differential—is reduced by more than 70% in the latter scenario.

3.4 Competition over corporate taxes

According to Devereux et al. (2008), taxation of corporate income in Europe has changed a lot in the last 20 years. Many Countries have decreased the tax rate and broadening tax base to be more attractive to other Countries. In particular between 2003 and 2013 68 corporate tax changes have been found (11 increases and 57 decreases in statutory tax rate).

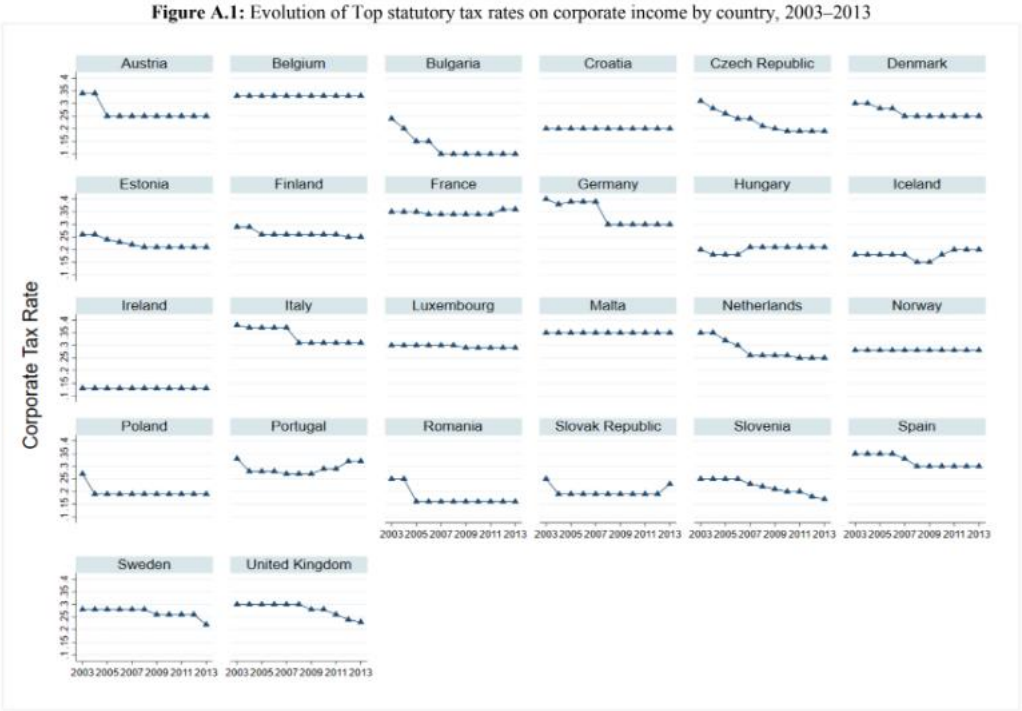
Figure 1 (Alexander et al. 2020) and table A.1. show a yearly average of corporate tax rate across EU Countries. As we can notice, there's a decreasing trend over that period, consistent with the general decrease in tax rates (as Devereux et al. 2022 stated). Changes in corporate taxes occured in almost all Countries in Europe, but we also have to take into consideration that economic conditions in one single Country can drive tax rate changes.

Figure 1: Corporate Tax Rate in Europe, 2003–2013



This figure plots the yearly mean of the corporate tax rate across 26 European countries over 2003–2013.

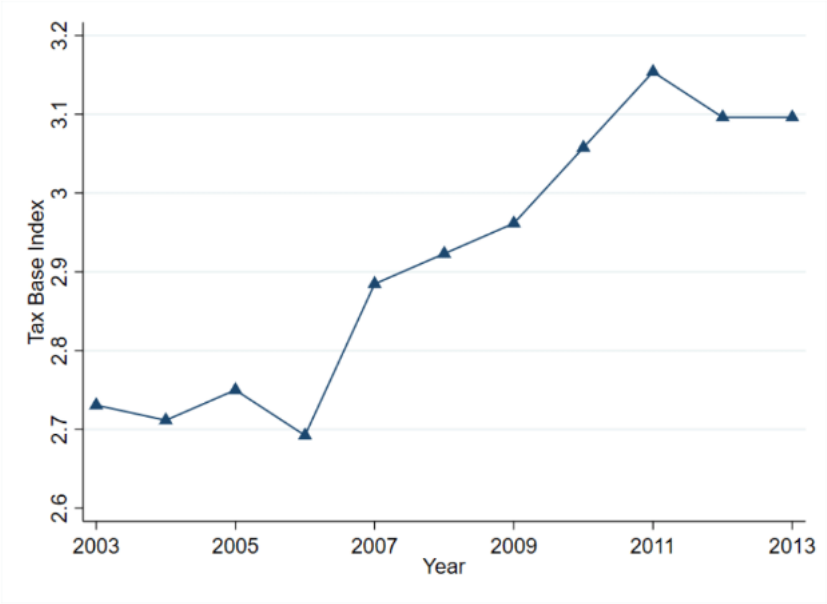
Figure A.1: Evolution of Top statutory tax rates on corporate income by country, 2003–2013



Notes: This figures displays the evolution of corporate tax rates (in percentage points) by country during 2003–2013. Each country–year observation is from *Taxation Trends in Europe 2014*, Eurostat.

Figure 2 and table A.2 (Alexander et al. 2020) show the yearly average tax base idex. It has increased over years from 2003 to 2013 in EU Countries.

Figure 2: Tax Base in Europe, 2003–2013



This figure plots the yearly mean of the tax base index across 26 European countries over 2003–2013.

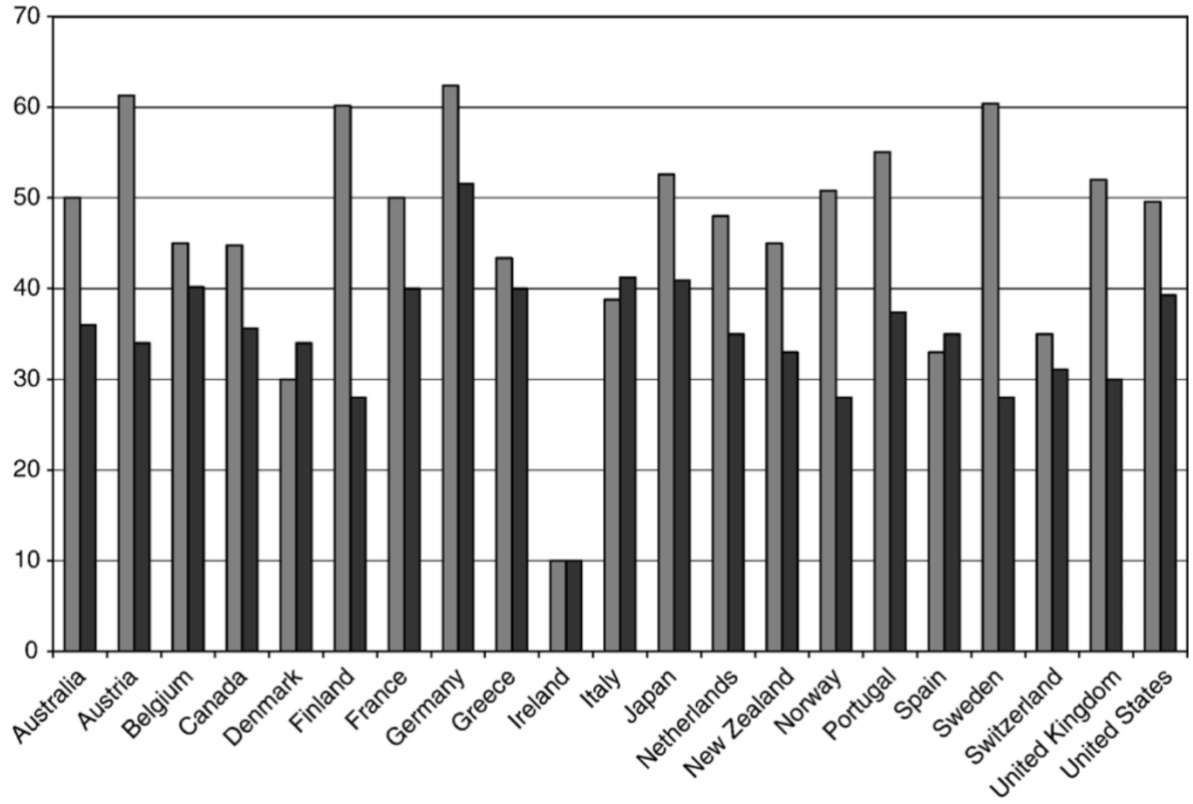
Figure A.2: Evolution of Tax base index by country, 2003–2013

Notes: This figures displays the evolution of tax base index by country during 2003–2013. Each country–year observation is from the E&Y Corporate Tax Guides.

Devereux, Lockwood, Redoano (2007) use an empirical method to estimate the effects of corporation tax regimes across 21 OECD Countries between 1982 and 1999. The analysis begins with an evaluation of corporate tax rates, which can be measured in two main ways.

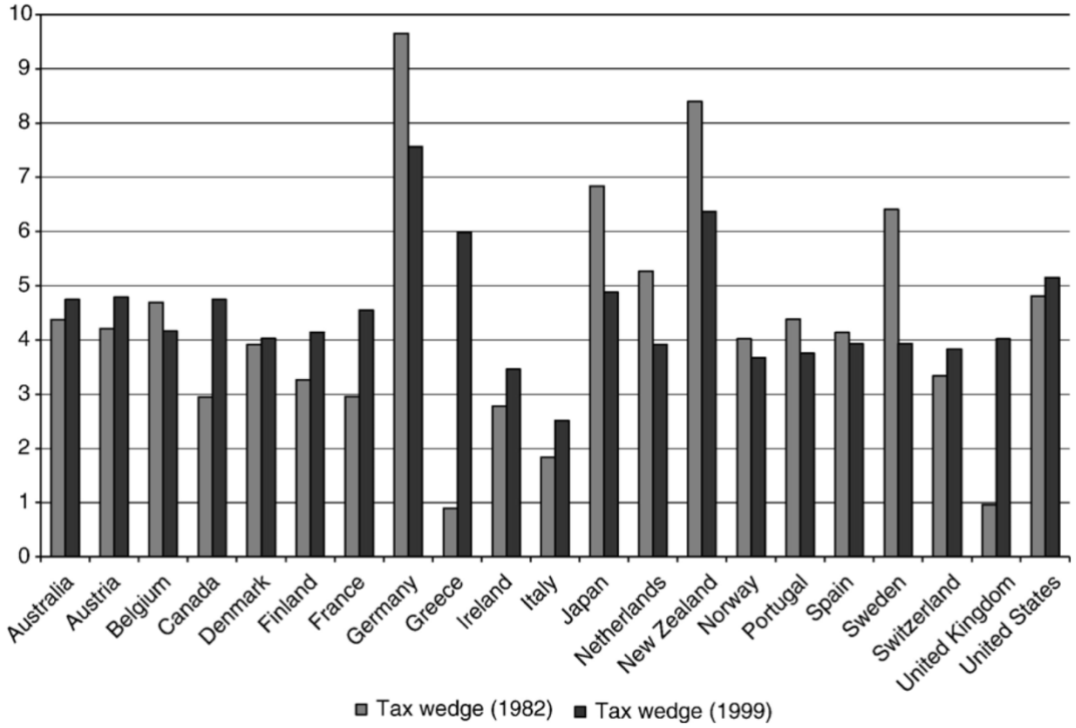
One common method calculates the effective tax rate as the ratio of tax payments to the economy's operating surplus. However, this approach is deemed inadequate for studying tax competition between jurisdictions because it only provides an effective average tax rate, fails to capture the impact of taxes on investment incentives in specific locations, and is influenced by economic factors beyond government control.

The figure below shows how Countries have reduced their statutory rates between 1982 and 1999. Germany, in particular, is essentially the last Country that in 1999 had an high tax rate. Ireland is the only Country different from the others because it has used a 10% rate for manufacturing.



Devereux, M. P., Lockwood, B., and Redoano, M. (2008): Do countries compete over corporate tax rates? Journal of Public Economics, 92(5–6).

The second figure presents tax wedges. They have risen in many Countries because of the broadening of tax base. 1984 reform in the UK reduced capital allowances. These figures suggest that statutory rate and tax wedge are not highly correlated. 7 Countries out of 20 have negative correlation between statutory tax rate and tax wedge.



Devereux, M. P., Lockwood, B., and Redoano, M. (2008): Do countries compete over corporate tax rates? Journal of Public Economics, 92(5–6), 1210–1235.

Competition over taxes in Europe depends also on tax accruals accounting given that taxes are paid on net profits.

Accrual accounting in tax setting can lead to two potential costs:

1. It requires judgment in estimating income, leading to opportunistic discretion to manage taxable income (Boynton, Dobbins, and Plesko [1992]).
2. Accrual accounting can lead to undesirable outcomes. Accruals may boost the correlation between aggregate corporate tax revenues and economic activity (Guenther and Young [2000], Hanlon and Maydew [2009]).

This can lead to procyclical accrual-based taxable income: higher tax revenues when the economy is booming, and reduced funds when the economy is contracting (Lane [2003]). Whether a Country chooses an accrual-based tax regime or not depends on its preference for smoothness and predictability of tax revenues over responsiveness of corporate tax revenues to economic shocks.

In each OECD Countries, tax rules have some degree of accrual accounting. Some of these Countries tax rules have accelerated depreciation and require short useful lives. Some others (such as Austria, Ireland and Hungary) allow only straight-line depreciation and require

depreciation over longer lifetimes. Research and development expenses can sometimes be capitalized and, therefore, amortized.

Over the lifetime of a company, accrual-based income is equal to cash-based income. The difference between the two systems is timing of income and expense recognition. Accrual accounting requires revenues to be accounted in the period in which they are earned, while expenses are matched to the revenues they generate. Cash accounting records income and expenses when there are cash inflows and outflows.

According to Boyton, Dobbins and Plesko (1992) and Guenther (1994), firms sometimes manage accruals to reduce the present value of taxes. Earnings management can therefore reduce the correlation between taxable income and underlying economic performance.

Peress (2010) presents a model that links investors' trading behavior to the degree of product market competition. Shares trading volume and the information content of stock prices are higher for firms with more market power. Therefore, this study finds that market deregulation has implications for equity markets. The model in the study suggests that competition can worsen stock prices and makes volatility increasing.

Conclusion to chapter three

Chapter three has given an overview on tax regulation inside European Union, how tax rates different from one Country to another and how harmonization could change the whole European taxation background.
It goes through base erosion profit shifting strategies and then focuses on how corporation taxes have changed over the year and the Countries. This was the last theoretical chapter and the one following is the Chapter based on data analysis and the empirical part of this final work.

Chapter 4: research on tax planning and product market competition in the European Union

Introduction to Chapter four

This last chapter presents the empirical part of the master thesis, analyzing data and finding coefficient of regression.
The first part of the chapter gives an overview of how the sample is composed and which variables are taken into consideration in the analysis. It then explains how variables for product market competition (independent variable) and tax avoidance (dependent variable) are computed and involved in the model. Then hypothesis and regression model are presented, as well as controls in the model.

4.1 Methodology

4.1.1 Sample

The research aims at analyzing the effect that competition has on tax planning and tax avoidance in 27 Countries of European Union. The sample is comprised of 1972 listed firms inside European Union. Companies were not divided by sector. The observations include the period 2013-2023, so they cover the last 10 years. The research was conducted on ORBIS database. The research steps of the research are the following: I selected the active companies, then selected only listed companies located in the 27 States of European Union. I then chose the companies with the following available variables: total revenues, cogs (cost of goods sold), EBITDA, depreciation and amortization, EBIT, profit/loss after tax, total equity, total assets, current assets, total reserves, debts, shareholders' equity. I also add the most important profitability indexes to the research: ROE (return on equity) and ROA (return on assets).

I chose the following variables (displayed in Table D) to create my database that I then imported in STATA. The database built on STATA presents 1.489 observations, displayed the following variables:
Year: displays the year to which data refers to.
Total revenues: they are computed adding all income coming from sales of goods and services for a specific time (usually one year).

Cost of goods sold (Cogs): it refers to the direct cost of producing goods sold during the period. It's computed taking into consideration the difference between ending and beginning inventory plus the purchases made in the period of time chosen.
Tax: total taxes paid by the company for the result of that year.
EBITDA: earnings before interest, taxes, depreciation and amortization. It takes total revenues and operating expenses.
Depreciation and Amortization: depreciation is a cost imputed yearly to tangible assets, while amortization refers to intangibles.
Rnd costs: costs for research and development for that year.
EBIT: earnings before interest and taxes. It's computed starting from EBITDA and subtracting depreciation and amortization.
Profit/loss before tax: it's calculated by taking EBIT and subtracting interest expenses.
Profit/loss after tax: it's calculated by taking EBIT and subtracting interest expenses and taxes.
Total equity (called "patrimonio netto" in ORBIS): it's the residual subtracting liabilities from assets.
Total assets: it's the sum of current and non-current assets reported on balance sheet.
Current assets: these assets are expected to transform into cash within a year. They are the sum of cash, accounts receivables, inventory, short term investments.
Ppe: property, plant and equipment. The vaue is taken into consideration to absorb the effect of accelerated depreciation.
Ln_sale: it's the natural logarithm of sales. It represents the size of the company, taking sales as variable of reference and taking its natural logarithm.
Intangibles: total non-tangible assets on the balance sheet of the company.
Leverage: ratio indicating the level of debt of the company.
Total reserves: includes retained earnings and other reserves.
Debts refer to all liabilities, usually separated into current and long-term liabilities.

I then created a dataset in STATA including the following variables exported from database:

- Identification number: defined as "numero orbis ID". It represents a code given to each company on the database ORBIS.
- Last year: last year of available data on the database.
- Total assets
- Current assets: define the reclassified assets that the company expects to use or convert into cash in one operating cycle (usually one year).

- Current liabilities: liabilities that a company expects to convert into cash untill the term of one operating cycle.
- Intangible assets: assets that are not physical that are, despite from this, creating value for the business.
- Debts: financial debts (such as loans) in the balance sheet of the company.
- Equity: it represents the common shareholders' equity ("capitale sociale")
- Provisions: liabilities that are created to cover future potential losses that are uncertain. They are usually current liabilities and they are also reported on income statement. Provisions are taken as accruals (and in this case treated as a control).
- Total revenues: they include revenues and other revenues.
- Cogs: cost of goods sold.
- R&D expenses: they are considered as accruals (and taken as controls), since they are occured expenses, not yet paid.
- Ebitda: earnings before interests, depreciation, amortization.
- Nopat: net operating profit after taxes. As the name recalls, it only refers to operating profits (that is the core business).
- Depreciation and amortization: non-monetary costs, considered as accruals.
- Ebit: earnings before interest and taxes. It's namely the operating income, since it doesn't take into consideration financial income/expenses nor extraordinary items.
- Income before taxes: total income before taxes.
- Total taxes.
- Income after taxes.
- ROA: return on assets. It indicates the profitability of the company.
- ROE: return on equity. It represents the return only for shareholders.
- Number of employees.
- Ppe: property, plant and equipment. Material assets of the company.
- Leverage: leverage index of the company.
- Sic code (standard industrial classification code): given to the company according to the sector the company is working in.

Many of these variables were in string format, therefore computations couldn't be made. I had for this reason to destring some of variables.
Using the software stata, other variables useful for the regression were computed.

In order to compute the Herfindahl-Hirschman index, first of all I generate (using the command "egen") a new variable, (sic2_year) grouping the combination of sic2 and year. The command "cap drop" is then used to delete any error message that could occur if sic2_sales doesn't exist. The same happens for i_sales.
I then generated the variable "sic2_sales", that is the sum of totrev_num for each combination of sic2 and year. The variable i_sales2 is then generated, dividing totrev_num to sic2_sales and it represents the market share of observations compared to total group.
In the end hhi2 is generated. It is computed as the sum of squares of market shares and is a measure of market concentration. Higher values indicated less competition.
Entry barriers are generated creating the new variable "entry_I", which is the ratio of ppe (representing fixed assets) to i_sales2 (which is the market share). Then the variable "entry" is created as the sum of entry_i for each sic2_year group. The natural logarithm is computed for the variable "entry". Natual logarithm is computed to linearize the variable.
To compute substitutability I took the sum of the ratio of total revenues and cogs for each sic2_year group. This measure is an indicator of efficiency for each industry-year combination.
The size of the company is calculated using the natural logarithm of total assets and total sales (generating ln_at = ln(totass_num) and ln_sales = ln(totrev_num)).
Product market competition is computed creating the variable "pcm_I" which is the ratio of ebit and total revenues. The ratio measures profitability of the company. The variable "a" is created to measure the weight that every company has in the market. It weights profitability for each observation based on market share (it's the product f pcm_i and i_sales2).
In the end the variable "pcm" is created, that is the difference of the individual performance (pcm_i) and the industry average (pcm_sic2).
Profitability is computed generating the variable "pt_roa" and calculating the ratio between profit before taxes and lagged total assets.
Then lagged ROA variables are computed, for the last 4 years. The standard deviation of ROA is also calculated (egen sd_roa3=rowsd(pt_roa l1_roa l2_roa). The variable sd_roa3 computes the standard deviation over the last three years. The variable "sd_roa5" measures the variability of ROA over the last five years.

"Mtb" is the variable that measures market value over book value of the enterprise. It's computed dividing market capitalization (found on the database ORBIS), that represents market value of equity over book value of equity (gen mtb=(mcap_num)/equity_num)).

In the end, the dependent variable ETR is generated. The command "gen etr" is used and the variable in calculated as the ratio of total taxes and ebit.

4.1.2. Measure of market power

Market power can be measured in different ways, price-cost margin is often used to compute competition in the market (Kubick et al, 2015). Other studies use another index, called Herfindahl-Hirschman Index (HHI). I decide to use this index as well. Herfindahl-Hirschman index is a common way of measuring market concentration.
It's computed using the squares of the market shares of all the firms in the market and dividing the single company market share for that value. The value is found between 0 and 10.000. The higher the value, the higher the market concentration and lower the competition.

$$HHI = \sum_{i=1}^{N} (S_i)^2$$

4.1.3. Measure of tax avoidance

Tax avoidance is defined as the firm's explicit tax liability (Dyreng et al. 2008; Hanlon and Heitzman 2010). Since I want to capture the full range of tax avoidance, I decided to take the effective tax rate (ETR). ETR looks at firm's tax burden. It represents the book effective tax rate and, therefore, it doesn't capture temporary effects of book-tax differences (e.g. deferrals). Another used measure of tax rate is "cash effective tax rate" and it reflects temporary and permanent differences and, moreover, it is unaffected by tax accruals. In this research I use "total tax" as measure of tax avoidance, which represents the effective book tax rate.

4.2 Hypothesis and regression model

To analyse the effects of product market competition on tax avoidance, I employ an ordinary least square (OLS) regression based on Kubick et al. (2015). In the study the following regression is conducted: the dependent variable is "tax" and it's a proxy of tax avoidance (that can be computer in different ways, for example considering effective tax rate, cash effective tax rate, long-run cash effective tax rate).
The independent variables are: price-cost margin (excess price-cost margin for each firm every year), return on assets, performance-matched pretax discretionary accruals, firm size, foreign income (pretax income from foreign corporations), equity income earnings, reported intangibles, property plant and equipment, positive tax loss carryforward, change in positive tax loss carryforward, market-to-book ratio, leverage, free cash flow (operating cash flow less capital expenditure), research and development expense, Herfindahl-Hirschman index (sum of squared percentage of sales by firms in a given industry).
The starting hypothesis is that product market power could positively influence tax avoidance.

H1: product market power and tax avoidance are positively related.

Many researches find that product market power is a natural hedge against low outcomes. Firms with high product market power can get over negative cash flow shocks, having less variable earnings and cash flows. Moreover, tax avoidance can smooth the relation between product market power and stock price or stock returns.
Herfindahl Hirschman index. I compute the index on Stata, taking total company revenues divided by market revenues.

When it comes to taxes, there are different measures of taxation. According to Kubick et al. (2015). those are: cash effective tax rate (CETR), which shows temporary and permanent differences and it's not affected by tax accruals. Annual effective tax rate shows the accrual-basis tax burden during fiscal year and it is computed as the ratio of total expense.
Long effective tax rate is instead the sum of total expense from year t-4 to year t, divided by the sum of income before taxes. "Tax" is used as general indicator of taxation.
I used the command "destring" to make all variables numerical. I then renamed all variables using "num" after the variable's name.

All variables are winsorized in order to exclude extreme values (outliers) from the dataset to reduce their impact on the regression, because they can distort statistical analyses.

Entry barriers are computed using ppe and dividing the value for sales.
Product substitutability is instead computed creating a new variable (sust) that is the sum of the ratio of revenues (totrev_num) and cost of goods sold (cogs).

The results show that the mean of the index of competition is close to 0, meaning that the market is highly competitive. No single firm or small group of firms control the market. Therefore, the market has low concentration of market share among firms. Since there's not a single (or few) leader(s) in the industry, it's said to be fragmented. Given all this information, the risk of a monopolistic behavior is very low, almost close to 0. The index has no significant changes over the years.

"Etr" is the dependent variable in the model of this research as well.
Variable of interest: PMC. PMC is the industry-adjusted price-cost margin. β_1 is the coefficient of this variable and it measures the effect of product market competition on tax avoidance. A negative coefficient would mean that companies take advantage of their strength in product competition in order to avoid more taxes and this would be in line with H1.

Operating profits are represented by the variable "ebit_num". Ebit_num variable is not computed, but found in the database. Ebit represents "earnings before interest and tax" and it's therefore a good proxy of operating profits and it's used in the computation of product market competition.

The size of the company is computed using the natural logarithm of total assets of the company. Natural logarithm is used for easier comparisons between companies that differ a lot from each other. For example, comparing a company with 1 mln revenues and one with 100 mln can be difficult without using logarithms.

4.2.1 Controls in the model

According to Gupta and Newberry (1997), profitability is positively associated with tax avoidance and return on assets (ROA).
As Siegfried (1974), Stickey and McGee (1982), Gupta and Newberry (1997) state, firm size is an approximation for firm resources and political sensitivity. Firm size is computed as total revenues of the firm.
The variable firm SIZE is computed as natural logarithm of total assets (wlnat).
The variable INTANG is set as control, since it shows how intangibles are treated for book and tax purposes.
PPE controls for accelerated depreciation according to Stickney and McGee (1982).
Leverage (LEV) and costs for research and development are the last two control variables I set.
Two variables are then taken as proxies of discretionary accruals: rd (research and development) and da (depreciation and amortization).
HHI: It is the industry-level sum of the squared firm-level market share.

4.2.2 Model

The model is represented as follows:

$$ETR_{i,t} = \gamma_0 + \beta_1 PCM + \beta_2 SIZE + \beta_3 LEV + \beta_4 ROA + \beta_5 RD\_dum + \beta_6 HHI$$

I then used the command “absorb” to control for fixed effects in the regression. I absorbed the effect of “orbisid” (the id of the companies) and year (the time the observations were made).
I then used the command “cluster” to adjust for standard errors in regression models for clustered data. In statistical analysis, observations of data in clusters are often not independent and this goes against the assumption of independence that’s fundamental in many statistical models.

4.3 Results

4.3.1 Descriptive statistics and correlation

In order to analyze data, I use the statistical software STATA to obtain descriptive statistics and also conduct the regression on data.
The available variables I imported on STATA are total assets, current assets, intangibles, debts, equity, provisions, total revenues, cost of goods sold, research and development, EBITDA, depreciation and amortization, EBIT, profits before tax, total taxes, profits after taxes, ROA, ROE, number of employees, ppe, leverage and SIC code.

Table A shows the main statistics of the variables of the model, in particular it shows the number of observations, the mean for each variable, standard deviation, minimum value, p25, p50, p75 and maximum value.
Etr has a mean of 0,21817, a standard deviation of 0,1744561, the minimum value is 0, the maximum value is 1.
Pcm has a mean of 0,1143161 and a standard deviation of 0,1098725. Minimum value of –0,03845 and maximum value of 0,5739753.
Natural logarithm of total assets as a mean of 12,59304, standard deviation of 2,357, minimum value of 7,31739 and maximum value of 18,09165.
Leverage has mean of 0,00145, standard deviation of 0,0039525, minimum value of 0 and maximum of 0,0270713.
ROA has mean of 3,268543, standard deviation of 11,89344, minimum value –2,3986 and maximum 81. Rnd dummy has mean 0,3047, standard deviation 0,4603173, minimum 0 and maximum 1.

Table B shows the correlation between all variables of the model. Correlation shows a statistical relationship between variables and it indicates that changes in one variable lead to changes in another one.
If variables have a positive correlation, an increase in one variable means a decrease in the other. A negative correlation means naturally the opposite. Correlation coefficient goes from –1 to 1. A value close to 1 means that the variables are strongly positively correlated, while a coefficient close to –1 means they are strongly negatively correlated.

Correlation doesn't necessarily mean causation. Even if two variables are correlated, they don't necessarily have a causal relationship. On the opposite, if there's causality between two variables, they are also correlated.

Correlation of a variable with itself is obviously equal to 1, since it's perfectly correlated with itself.

Correlation between etr and product market competition is –0,1478. This value is coherent with the regression model in which coefficient of pcm is negative and it stresses the fact that effective tax rate and product market competition are negatively linked to one another.

Correlation between etr and size of the company is positive, namely 0,0069. This is again coherent with regression model and means that the bigger the company is, the lower taxation is. Etr and leverage are negatively correlated, while etr and return on assets are positively correlated. Effective tax rate and Herfindahl-Hirschmann index have a positive correlation index, meaning that statistically, when one variable moves, the other one moves in the same direction.

4.3.2 Regression

```
HDFE Linear regression                            Number of obs   =      8,949
Absorbing 2 HDFE groups                           F(   6,   1351) =      21.86
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.4068
                                                  Adj R-squared   =     0.2998
                                                  Within R-sq.    =     0.0450
Number of clusters (id)      =      1,352         Root MSE        =     0.1460

                                (Std. Err. adjusted for 1,352 clusters in id)
```

etr	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
wpcm	-.6086182	.053441	-11.39	0.000	-.7134545	-.503782
wln_at	.0003312	.0023494	0.14	0.888	-.0042777	.00494
wlev	.1863121	.6633999	0.28	0.779	-1.115094	1.487718
wpt_roa	.000649	.0005025	1.29	0.197	-.0003368	.0016348
rnd_dum	-.0035031	.0083429	-0.42	0.675	-.0198696	.0128634
whhi2	-.0253357	.0352551	-0.72	0.472	-.0944964	.043825
_cons	.2882484	.0315512	9.14	0.000	.2263538	.350143

Absorbed degrees of freedom:

Absorbed FE	Categories	- Redundant	= Num. Coefs	
id	1352	1352	0	*
year	10	0	10	

* = FE nested within cluster; treated as redundant for DoF computation

F test is equal to 21,86, meaning the overall significance of the regression model. According to this value of the F-test, there's a strong likelihood that the model provides a good insight into the relationship among variables.

R-squared is equal to 0,4068 and it means that approximately 40,68% of variability in the dependent variable is explained by the independent variable. This suggests that independent variables included in the model explain just a little of the variability of dependent one, while remaining variance depends on factors not included in the model or, more generally, errors.
Therefore, the model has good predictive power, but it could still be improved.
R-squared has however an important limitation. It cannot explain causation.
An high R-squared doesn't mean that independent variables have casual effects on dependent variable. The model only explains association between variables.
Number of clusters is 1352. Clusters in the model are id, meaning the identification number ORBIS gives to each company in the database.

According to the results, product market competition has a negative effect on total taxation, meaning that total taxes increase when market competition decreases (namely they decrease by 0,6086). The result is therefore coherent with the initial hypothesis and with previous studies that state that usually, biggest companies with higher market power enjoy more tax avoidance and tax planning incentives.
The coefficient is statistically significant since p-value is 0,000. This means that there's strong evidence against null Hypothesis in the test. Essentially, this means that there is strong evidence to suggest that there is significant effect or relationship in the data. Product market power can therefore be linked to tax avoidance and our initial hypothesis can therefore be correct.
The reasons why higher market power is associated with lower effective tax rate and thus more tax avoidance, is the fact that bigger companies can more easily involve in lobbying or, taking advantage of their power, can more easily hire professionals to avoid taxes.
Even though bigger companies have probably higher income (and should therefore pay higher taxes), they can also more easily have strategies that lead to the lowering of total taxes.

Firm size, indicated as natural logarithm of total assets, seems to have a positive effect on total taxation (coefficient=0,00033). Despite this, it's not statistically significant, but it's coherent with reality. Bigger companies have higher pretax income and therefore higher taxes to be paid on that.
Leverage has a positive impact on total taxation, meaning that the higher the leverage, the higher effective tax rate.
Company profitability, here displayed as return on assets (ROA) has a positive effect on taxation (coefficient = 0,000649), meaning that the higher the profitability of the company, the higher the effective tax rate. This result can have different reasons: one of those being profitability. Higher ROA means better asset efficiency and profitability. If a company is generating more income, it can pay more taxes, leading to a potentially higher effective tax rate. Companies with higher ROA could have higher depreciation and tax credits. While this can reduce taxable income, the overall higher profitability can lead to a higher effective tax rate.

Research and development expenses are taken as proxy of discretionary accruals (and therefore assumed future costs. The positive coefficient means that, the higher R&D costs, the higher total taxes for the company). Research and development is here taken as a dummy, having value 1 if the company has research and development costs in the income statement, 0 otherwise.

Research and development costs have a negative effect on tax avoidance. This result is coherent to reality since, the higher costs are for a company, the lower effective tax rate is.

Herfindahl-Hirschman index (showing the market share in the market) is negatively related to total taxation (coefficient is –0,02533) meaning that, the higher the market presence, the lower the effective taxation.

4.4 Comparison to other studies

Even if literature is not that wide when it comes to taxation and the relationship to competition, some authors already got to some results.
Previous studies found a linkage between tax avoidance (or tax planning) and competition. For example, Hou and Robinson (2006) state that market power enables firms to achieve a more stable and persistent profitability. Therefore, companies that have a stable profitability can benefit more from tax planning because managers can more easily predict what the tax burden will be. According to this study, product market power can lead to benefits for tax avoidance. Companies with stable profitability are usually the biggest and more powerful ones in the market. This is coherent with what I found through my analysis because, according to the regression of this study, higher market power leads to lower total taxation.

Peress (2010) writes that market power is important also for firms' non-operating decisions, such as fiscal decisions. The study links investors' trading behavior to product market competition. According to the results of the analysis, companies with higher market power have larger stocks trading volume. This means that information about competition is embedded in stock prices and when companies issue new shares, capital is more efficiently deployed across more monopolistic firms. Trading volume and information content of stock prices are higher for firms with more market power. Even if the study is not directly about taxation, but more about market competition generally, it raises the issue of decisions inside a company and taxation as one of the main factors to take into consideration.

Another study where market competition is linked to tax avoidance is the one made by Goerke and Runkel (2011). They indeed show, as I did, that intense competition may have the negative side effect on increasing tax evasion. According to them, intense competition increases tax avoidance, public revenues are lower as well as welfare and they find a similar result if marginal production costs fall. There would be more competition, less evasion and higher public revenues if marginal production costs fall and demand is convex and elastic or demand elasticity increases. The policy implication is that tax enforcement should be intensified if there is a negative trade-off between competition and evasion.
They also show that reducing market power may induce firms to intensify tax evasion activities, thus eroding public revenues and possibly contributing to a decline in social welfare. In such cases, competition policy should be accompanied by a greater effort to fight tax evasion.

The key of the paper is that competition policies may have negative side effects that go against the positive impact of increasing competition. The study reveals that tax evasion may substitute market power from companies' point of view. On the opposite, more competition, less tax evasion, and higher public revenues will be obtained by a decrease in marginal production costs, if demand is elastic and by an increase in price elasticity of demand. A basic trade-off between competition and tax evasion is also hold when detection probability negatively depends on number of firms.

Zimmerman (1983) states the opposite, since bigger firms have less possibility of choice when it comes to tax policies. For this reason, they have less possibility of involving in tax avoidance and should stick more to the rules. Since authorities and governments are stricter with bigger firms and they are often under control, the product market competition is positively linked to total taxation, meaning that the bigger the firm, the higher total taxation. This result is not coherent with my analysis, but there are reasons to believe that both results can be considered valid and true.

On the other hand, Porcano (1986) found a negative effect of firm size on ETR. Porcano's result is coherent to what I found in my analysis. This happens because large firms can more easily involve in lobbying or hire professionals to avoid taxes. Other authors, like Shelvin and Porter (1992) and Manzon and Smith (1994) find that firm size doesn't really influence ETR.

Different studies lead to very different results. This may happen because data collected can differ a lot from Country to Country and reasons for tax avoidance can diverge a lot. In my analysis, size seems to influence taxation in a positive way, meaning that the bigger the company, the higher taxes. The effect of size on corporate taxation is not one and only because many factors influence tax planning of a corporation and size can be either a positive or a negative factor when it comes to taxation.

Listed companies likely enjoy tax preferences. Tax preference competition also reflects competition among local governments in capital market. Since listed companies provide finance and employment pressure to the economic system, the local government gives often support if the companies share employment pressure and hire more people.

Kubick et al. (2015) found that product market power is strictly related to tax avoidance and this suggests that product market power leads to higher incentives and opportunities for firms to involve in tax avoidance. Moreover, companies with higher product market power have an advantageous position and have more incentives in engaging in tax avoidance.

To sum up, results coming from different studies are very different from each other and no single conclusion can be taken as the best one. Data can differ a lot from one research to another and this can be the reason for differences in results. Moreover, different variables are taken.

Conclusion

The literature on product market competition and tax avoidance is growing more and more, but despite of this, there's still scarcity of papers on this topic. Future research should focus on determinants of product market competition. Product market competition can be analyzed from different perspectives: accounting, finance and corporate governance. As we can see from different studies, there's not a lot of evidence on the relationship between product market competition and reporting quality. Moreover, there's lack of theory on this, on problems of industry concentration and on disclosure. New research should also focus on cross-Country studies, since competition depends also on institutional differences and different taxation rates.

Product market power is the ability to determine price, quality and nature of a product in the market (Shepherd, 1970). This means that product market power can influence firms when it comes to tax avoidance and tax planning. According to Kubick et al. (2015), companies with higher product market power have a stronger position, more consistent profits and therefore natural hedge. For these reasons, they could engage more in tax avoidance.

I this final paper, I studied in particular the relationship between corporate tax avoidance and product market competition inside European Union. I took data of all listed companies of EU Member State and considered the most important variables for what concerns size, profitability, taxation.

I analyze tax avoidance and how this behavior is linked to product market competition and companies in general. The first chapter gives a general overview on tax avoidance and tax planning. The main tax avoidance strategies are delivered, as well as the consequences of tax avoidance. The focus is on corporate tax avoidance and determinants of this behavior are explained.

The second chapter is about product market competition. I start talking about determinants of product market competition and then I displayed consequences of market power both inside the company and outside (in the market). I then linked the two topics finding how product market power affects tax avoidance practices.

This is the starting point for the assumption made in Chapter 4, where data is actually analyzed. Chapter 3 gives a general overview about corporate taxation in European Union and the possibility of harmonizing the taxation system in all Member States.

Profit shifting and competition over taxes have a special mention in the chapter, since multinational companies always aim at lowering taxation shifting profits in low tax Countries.

Chapter 4 entails the research part of this work. The aim of the work is investigating how tax avoidance is influenced by other factors in European Union, what is the relationship between them and how strong the effect is.
In this last chapter the research method is explained, data used for the research are displayed, as well as the regression and results.
I started from the Kubick et al (2015) work and took it as a reference. I then followed their steps to analyze the data I collected from ORBIS database.
The dependent variable is etr, effective tax rate and represents one of the most common ways of measuring total taxation of a company. The independent variable is product market competition and controls are natural logarithm of total assets, profitability (measured as return on assets), a dummy measuring research and development costs and Herfindahl Hirschmann index.

The results show that product market competition has a negative impact on effective tax rate, meaning that there's a positive linkage between product market competition and tax avoidance. Seeing this result, I can say that, as hypothesized earlier, product market competition has a positive effect on tax avoidance.

To sum up, tax avoidance is an important matter when it comes to corporate decisions and different factors can influence tax avoidance. These factors, for example, ownership structure, managerial power, size, profitability, leverage of a firm, are important when it comes to decision making process. On the other side, taxation influences corporate decisions as well, especially when it comes to location decisions.

Tables

Table A (descriptive)

variable	N	mean	sd	min	p25	p50	p75	max
etr	8949	.2181707	.1744561	0	.1238019	.201665	.2677043	1
wpcm	8949	.1143161	.1098725	-.0384566	.0443524	.0820112	.1403625	.5739753
wln_at	8949	12.59304	2.357099	7.317392	10.93171	12.39287	14.30453	18.09165
wlev	8949	.0014502	.0039525	0	.0000227	.0001611	.0008404	.0270713
wpt_roa	8949	3.268543	11.89344	-2.398616	.0034796	.0530757	.5908744	81.23562
rnd_dum	8949	.3047268	.4603173	0	0	0	1	1
whhi2	8949	.2367051	.0686567	.1657131	.2209146	.2209146	.2209146	.6783743

Table B (correlation between variables)

	etr	wpcm	wln_at	wlev	wpt_roa	rnd_dum	whhi2
etr	1.0000						
wpcm	-0.1478	1.0000					
wln_at	0.0069	-0.0493	1.0000				
wlev	-0.0085	0.0176	-0.4826	1.0000			
wpt_roa	0.0228	0.1318	-0.3341	0.2698	1.0000		
rnd_dum	0.0195	-0.0678	0.1323	-0.0580	-0.0388	1.0000	
whhi2	0.0181	-0.0084	-0.0050	-0.0039	-0.0231	0.0348	1.0000

Variables included in the models

Variable	Definition
Etr	Effective tax rate; computed as the ratio between total taxes and ebit (tax/ebit).
Wpcm	Product market competition (winsor); ratio beween ebit and total revenues (ebit/totrev).
Wln_at	Natural logarithm of total assets (indicating the size of the firm) (winsor).
Wpt_roa	Return on assets (profitability); computed as earnings before taxes/lagged total assets.
Rnd_dum	Dummy variable representing costs for rnd
Wlev	Leverage; computed as Debt/lagged total assets
Whhi2	Herfindahl-Hirschman index (winsor)

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