Essays on Transfer Pricing Risk

by

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To My Family…

Biography Note

I was born in 1984, in the city of Portimão, Portugal. Later, I completed my BA (HONS) in Finance at the University of South Wales, Cardiff. My professional career started in 2012, working as financial auditor at KPMG in Gibraltar, since then I have been working for the last 7 years as a transfer pricing practitioner in different consultant firms, and lately in Sonae (2016-2020). Currently I coordinate the international tax affairs at Group Foz Vintage.

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Abstract

This thesis is a combination of three essays on transfer pricing risk. The first essay studies whether tax convexity promotes transfer pricing risk profile of multinational firms. To this end, we develop an explicit measure of transfer pricing risk, and regress this on three different forms of tax convexity, first, negative income correlation, second, loss carryforward and third, loss carryback provisions. Overall results show that firms before tax convexity are associated with an increase in transfer pricing risk. Moreover, loss carryback provisions induced transfer pricing risk to be less responsive. Our results are robust using different methodologies and estimation parameters.

In a second essay we hypothesize about the level of transfer pricing risk, *ceteris paribus*, as a consequence of firms robust or weak internal governance structure. We develop an effective measure of transfer pricing risk and examine how responsive this is to firms' internal governance structures. We control our empirical inferences from risk management theories, and show that independent directors, audit/governance/risk committees, or institutional ownership have a negative effect on transfer pricing risk. Alternative tests reinforce these results by using different methodologies and parameters estimation that specify transfer pricing risk at different levels.

The third essay examines, first, investors valuation about transfer pricing risk, and second, whether country-level governance and transfer pricing regulation change their preferences. Our empirical results show that investors have a positive and significant valuation on firms with high levels transfer pricing risk. Similarly, investors also tend to value more transfer pricing risk in firms reporting potential tax avoidance profile. Our study informs governments and policyholders that corporate governance and transfer pricing ruling sustain investors valuation about transfer pricing risk and tax avoidance.

Resumo

A presente tese reúne três ensaios sobre a temática de preços de transferência. O primeiro ensaio estuda de que forma a convexidade fiscal, induzida por disposições na lei fiscal, incentiva o perfil de risco de preços de transferência das empresas multinacionais. A este propósito, desenvolvemos um modelo, explícito, que capta o perfil de risco de preços de transferência das empresas, e analisámos o seu comportamento perante três formas de convexidade fiscal, função de imposto negativa, a dedução de prejuízos fiscais a lucros em períodos posteriores, e anteriores. Na generalidade dos resultados, empresas perante convexidade fiscal apresentam uma associação positiva no aumento do risco de preços de transferência. Ademais, a dedução de prejuízos fiscais a lucros em períodos anteriores tem um impacto contrário (negativo) no risco de preços de transferência das empresas. Estes resultados são robustos usando metodologias e parâmetros de estimação diferentes.

O segundo artigo presume que o nível de risco de preços de transferência, *ceteris paribus*, seja uma consequência da robustez da estrutura de *governance* corporativo interno das empresas. Neste sentido, desenvolvemos uma medida efetiva de risco de preços de transferências e analisámos o seu comportamento em diferentes estruturas internas de *governance* das empresas. As nossas inferências empíricas são controladas por teorias de gestão de risco, e demonstram que a presença de diretores independentes, de um comité de auditoria/*governance*/risco, ou ainda, participação institucional no capital das empresas têm um efeito negativo no nível de risco de preços de transferência. Os testes alternativos permitem reforçar estes resultados com recurso a diferentes metodologias e parâmetros que especificam o nível de risco de preços de transferência das empresas.

O terceiro artigo investiga se os investidores valorizam o risco de preços de transferência, bem como, se as suas preferências variam em função do ambiente de *governance* e regulamentação de preços de transferência dos países. Os resultados apresentam evidência empírica que os investidores valorizam, positiva e significativamente, empresas com nível elevado de risco de preço de transferência. Ademais, investidores tendem em valorizar também perfis de risco de preço de transferência elevados em empresas com perfil de evasão fiscal potencial.

O nosso estudo esclarece governos e reguladores que o ambiente de *governance* corporativo, e políticas de preços de transferência agressivas são determinantes em atenuar as preferências dos investidores sobre o risco dos preços de transferência e a evasão fiscal.

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Chapter 1

1 Introduction

Since the last few years, world tax policyholders and local tax authorities have been scrutinizing multinational enterprises transfer pricing documentation to make sure where and how profit land amongst related parties. If until 2010 multinational enterprises were accustomed to report intercompany transactions in a relative tolerant environment where tax authorities lack innovation and know-how, nowadays, a kind of aggressive tax surveillance is in place. For instance, the organization for cooperation and economic development (herein OECD) sets transfer pricing policies as their major tax vehicle to restore and make public finances more sustainable. In line with this many examples succeed, for instance, the IRS (Internal Revenue Services) had tried to increase "Coca-Cola" taxable income in the United States from 2007-2009 by more than $9 billion. In the United Kingdom, the HM Revenue & Customs (herein, HMRC) identified that several thousands of multinational enterprises owe an additional €34.8 billion in tax from profits created in the U.K., but not reported in that same jurisdiction.

In the context of these events, an appropriate use of the arm's length principle requires a proper understanding about what the key drivers of value and risk are, either, in short-term or long-term business relationship perspective, as how much of the risk involved is attributed amongst the various parties. Accordingly, is well know from transfer pricing public discussion that different parties may have different perceptions about risk, and that meaningful application of transfer pricing risk continues open for debate. This usually involves enterprises within a multinational company (related-parties) and local tax authorities diverging or misinterpreting the risk at stake in a related-party transaction so that wrong allocation of risk and profits.

In this context, our thesis aims to provide a more comprehensive insight about risk in the context of transfer pricing given relevant scenarios likely to change this perception. Thus, our main research questions are, (i) how multinational firms transfer pricing risk chances according to country progressive tax system, (ii) how internal corporate governance mechanism sustains transfer pricing risk (iii) how country-level transfer pricing

legislation and external governance environment regulates multinationals transfer pricing, more specifically:

In the first essay, titled *"Transfer Pricing Risk and Tax Convexity: Empirical Evidence from OECD"*, we developed a model to capture firms transfer pricing risk at country-level, and examine how different forms of tax convexity are associated with transfer pricing risk. Important research has been devoted in identifying differences in cross-border tax rates as the key in determining multinationals risk profile (*e.g.,* Domar and Musgrave, 1944; Smith and Stulz, 1985; Graham and Smith, 2002; and Graham and Rodgers, 2002; Guenther et al., 2017; Langenmayr and Lester, 2018; and Albertus et al., 2019). However, remains unknown how tax convexity in scenarios of progressive taxation and other tax law provisions promotes transfer pricing risk in multinational firms. We find tax convexity in either scenarios (*i.e.,* progressive taxation and loss carryforwards) to have a significant and positive effect on transfer pricing risk. In alternative tests studying (i) whether risky intangibles encourage transfer pricing risk in firms facing high and low tax asymmetry, or (ii) using alternative risk measures, overall results are consistent with baseline regression estimates.

In a second essay titled *"Transfer Pricing Risk and Corporate Governance: Evidence from OECD countries"*, we extend and adapt the transfer pricing risk model from the first essay and allow this to capture for public-listed firms' exposure to changes in interest rates. We assume that greater exposure to interest rates increases the likelihood of non-arm's length terms and conditions between affiliated firms in financing arrangements. While many of the transfer pricing regulation and initiatives (*i.e.,* OECD transfer pricing guidelines, or BEPS) are focused on satisfying tax compliance requirements, we explore this gap by looking at the role of internal corporate governance structures in deterring firms transfer pricing risk. Particularly, we find the presence of independent directors to be the most effective factor, amongst others, in preventing firms transfer pricing risk. The robustness of results is tested through the consideration of alternative formulations. Baseline results remain true, emphasizing the presence of independent directors as critical.

In a third essay, titled *"Do Investors Value Transfer Pricing Risk? Perspectives from External Corporate Governance and Transfer Pricing Regulation"*, we invert the examination about transfer pricing risk by exploring this as exploratory variable of investors valuation. Existing literature examining the impacts of corporate tax avoidance is various in fields, such as, stock prices (Kim et al., 2011), performance (Desai and Dhamapala, 2009), firms' reputational costs (Gallemore, et al., 2013), and costs of debt (Goh et al., 2016), however, whether transfer pricing risk impacts investors' valuation has remained open for debate. In this context, we conduct a three-stage analysis. First, we investigate whether investors have a positive or negative valuation on transfer pricing risk. Second, we appeal to country-level corporate governance in monitoring investors valuation about transfer pricing risk. Third, we recall transfer pricing rules to monitor for investors preferences on transfer pricing risk. We find that investors valuation on transfer pricing risk is significant and positive. However, environments with robust corporate governance and transfer pricing rules attenuate investors preferences towards transfer pricing risk. Finally, robustness checks show that investors valuation on transfer pricing risk becomes lower, as volatility in transfer pricing risk increases. Moreover, we show that private investors value more transfer pricing risk than institutional investors.

Chapter 2

2 Transfer Pricing Risk and Tax Convexity: Empirical Evidence from OECD

2.1 Introduction

In recent years, multinational firms have been under the scrutiny of important tax reforms[1] as intragroup transactions gain relevance in global corporate taxable income or use complex pricing methods which increases firms risk exposure. One major reason concerning policyholders in international taxation relates to profit erosion (Clausing, 2009; Rego, 2010; Richardson et al. 2013; Taylor et al. 2015). Prior literature has evoked differences in cross-border tax rates and tax regulation (Devereux et al. 2008) as the critical factors behind high corporate risk (Domar and Musgrave, 1944; Smith and Stulz, 1985; Graham and Smith, 1999; and Graham and Rodgers, 2002; Guenther et al. 2017; Langenmayr and Lester, 2018; and Albertus et al. 2019). Nevertheless, remains open for debate how tax convexity in scenarios of progressive taxation (i.e., core tax structure) or other tax code provisions (i.e., extended tax structures) incentives transfer pricing risk. Moreover, how to capture multinational firms transfer pricing risk profile is still unexplored and open for developments.

As identified in Graham and Smith (1999), a core tax structure relates to firms' tax functions[2] in progressive tax systems, where a unit increase in income causes an increase in tax rate, therefore, higher taxable incomes generate higher tax liabilities. On other hand, extended tax structure relates to tax preferences in code provision like, loss carrybacks or loss carryforwards periods. In either scenario's firms are exposed to tax convexity at certain extend. In the first, convex tax functions arise, most often, when (i) firms show a great variance between profits and losses, regardless of the income level, (ii) taxable income is close to zero, or (iii) taxable income show negative correlation (negative income correlation). In the second scenario, loss carryforward periods or tax credits may

[1] Base Erosion and Profit Shifting (BEPS, 2015), and Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations (TPG, 2017).
[2] A tax function measures how firms' tax liability changes per a unit increase in pre-tax income.

cause the extended tax schedule to become convex, since firms reporting regular profits are less likely to have loss carryforward provisions, which implies higher expected tax liabilities. However, tax convexity in extended structures is less incisive as in core structures, as tax code provisions decrease the asymmetry on the tax treatment given to profits and losses. Accordingly, hedging practices in firms facing some form of tax convexity, reduce volatility of taxable income and expected tax liability. In the same way, we assume that multinational firms reporting tax convexity either, core or extended tax structures, are likely to adopt tax strategies and incur in further risk to reduce overall tax burden. A key tax strategy often uses transfer pricing techniques that focus on smoothing or eroding taxable profits, regardless of the abnormal levels of risk involved in the cross-border transaction. In this context, we believe that tax convexity can provide an incentive to multinational firms incur in a positive and higher transfer pricing risk.

To provide empirical evidence on these assumptions, we first developed a transfer pricing risk model with reference to country-level tax regulation, which allows to infer firms operating margin at risk if a potential transfer pricing adjustment applies. Second, we examine whether tax convexity, in different forms, incentives an increase in multinational firms transfer pricing risk profile.

We show that for every firm with negative income correlation, transfer pricing risk increases (0,043), compared to firms with null or positive tax functions. Similarly, for every increase in loss carryfoward periods, transfer pricing risk increases (0,043), while for every increase in carryback periods, transfer pricing risk decreases (-0,051). The positive and larger effects from loss carryforwards predicts the forward-looking strategy of transfer pricing in "hedging" uncertainty regarding future taxable income.

This paper contributes to existing literature by showing why multinational firms engage in higher levels of transfer pricing risk. Thus, we first model an explicit and distinct measure of transfer pricing risk versus measures in existing literature (John et al. 2008; Guenther et al. 2017; Albertus et al. 2019; or Hutchens et al. 2019) commonly conceived from a general corporate risk perspective (*i.e.,* standard deviation of adjusted ROA, volatility of cash flows, or effective tax rates). Moreover, our model takes account on the properties of Scholes-Wolfson framework by adopting a multilateral method and considering all forms of taxes, as transaction costs involved. In fact, this model expects

to enhance future research replicating transfer pricing risk across various industries and countries tax legislation. Second, at the best of our knowledge, this paper makes the first empirical contributions on how an explicit function of transfer pricing risk responds to core and extended tax properties as studied in Smith and Stulz (1985), Nance et al. (1993), Graham and Smith (2002), and Graham and Rogers (2002). Particularly, we show that transfer pricing strategies may provide firms with a valid instrument to reduce uncertainty in taxable income. Third, we extend contributions from prior research on corporate tax risk (Sandmo, 1971; Keen and Konrad, 2013; Khanna and Yafeh, 2005; Guenther et al. 2017; and Langenmayr and Lester, 2018) by showing that prior conclusions in these studies may change in the context of transfer pricing. Finally, this study also informs policyholders and governments about the need for harmonization in international taxation. Specifically, we show how entangled domestic tax law and transfer pricing principles encourage multinational firms to increase their transfer pricing risk profile. Despite the achievements of BEPS (2015) and other recent transfer pricing guidance (*i.e.*, on financial transactions or digital taxation) cross-country consensus between domestic corporate tax law and transfer pricing rules (*i.e.,* exploitation of intangibles, and risky transactions) lacks improvement and coordination. This paper encourages governments and policyholders for "friendly" [3] but "effective" tax policies, rather than harmful competition between OECD countries and low-tax jurisdictions (Becker and Fuest, 2012). The remain of the chapter is structured as follows: section 2.2. provides an overview in prior literature on transfer pricing and corporate tax risk; section 2.3 presents relevant theory and formalized the hypotheses; section 2.4 describes the sample structure and research design; section 2.5 presents the results and formulates alternative tests; and section 2.6 concludes.

2.2 Literature Review

2.2.1 Transfer Pricing

Transfer pricing at the center of this paper relates to prior literature on risk management, tax risk or transfer pricing aggressiveness. For instance, Klassen and Mescall (2018), applied a survey test to world transfer pricing experts, and developed a transfer pricing

[3] For instance, some governments competing for tax revenue, usually, offer great tax schemes/benefits (i.e., patent box regimes) to attract and retain foreign investment within their jurisdiction (Alstadsæter et al., 2015).

risk measure that previews the study of transfer pricing enforcement in the context of cross-border mergers and acquisitions. In the same spirit, Borkowski and Gaffney (2014), conducted a survey to tax authorities in PATA (Pacific Association of Tax Administrators)[4] countries and transfer pricing experts to assess firms transfer pricing exposure. On the other hand, Richardson et al. (2013) and Taylor et al. (2015) developed a sum-score approach of categorical variables based on the Internal Revenue Service (IRS) transfer pricing audits, to measure the effects of (i) size, leverage, profitability, intangibles, multinational and tax havens, and (ii) multinationality, intangibles, and tax havens, respectively, on transfer pricing aggressiveness.

2.2.2 Corporate Tax Risk

On the other strand of the literature, the seminal contribution of Neuman et al. (2019) developed a corporate tax risk measure considering three main sources of tax risk, that is, economic risk, uncertainty in tax law systems, and lack of reliable information. In fact, the whole rationale is in line with Fris et al. (2014), that require an effective application of the arms' length principle to be aligned with multinational firm's value maximization. Nevertheless, a pioneer research on the impact of taxes on investment decisions and corporate risk, started with Domar and Musgrave (1944), who examined how tax rates imposed by tax authorities on investor's wealth (private and corporate) would affect the level of risk-taking on investment decisions. Moreover, Feldstein (1969) demonstrated in a very weak form that proportional taxation does not cause, necessarily, investors to maximize risk-taking for higher yields. In a more strategic field of risk [5] and tax policies, Smith and Stulz (1985), Nance et al. (1993), Graham and Smith (1999) studied how hedging practices reduce uncertainty on future tax liabilities in firms facing convex tax functions. Additionally, the authors examined how this strategic uncertainty would interact with various tax law provisions like progressive statutory tax rates or tax-loss treatments. More recently, Guenther et al. (2017) presented empirical results on how different strategies to reduce tax burden and corporate risk could be associated. Finally, Langenmayr and Lester (2018) have added important theoretical and empirical contributions regarding corporate loss rules and risk, by showing how tax loss offsets

[4] Includes countries like Australia, Canada, Japan, and the United States of America.
[5] We assume that firms have a specific perception of risk, with these varying between strategic risk, operational risk, financial risks, and hazard risks.

determine the corporate level of risk-taking. In summary, prior literature has made clear to governments, policyholders, investors, practitioners, and research community about the importance of how transfer pricing and corporate tax risk affects innovation, investment, and economic growth. However, how different sources of tax convexity encourage multinational firms to induce or reduce transfer pricing risk remains imperceptible and open for debate in the context of the above-mentioned literature.

2.3 Theory and Hypotheses

2.3.1 The Association Between Tax Convexity and Transfer Pricing Risk in Core Tax Structures

Tax incentives to hedge convex tax functions was first introduced by Smith and Stulz (1985) that argued to low variability in pre-tax earnings to generate a reduction in expected corporate tax liability. One main source of a convex tax function is given by firms' reporting a negative serial correlated income (EBIT, for instance). In other words, properties as such means that firm's income becomes uncertain with frequent changes between profit and losses. Such events in progressive tax systems, make firms to become more sensitive to tax liabilities (Graham and Smith, 1999). However, this exposure can be managed if firms employ transfer pricing strategies that smooth income. Some of these techniques carry a certain degree of risk that is not always consistent with arm's length principle. In this context, our intuition is that multinational firms facing negative income correlation, as a proxy of tax convexity, are likely to show a positive association with transfer pricing risk. This reasoning drives us to the following hypothesis:

H1. *Negative income correlation is positively associated with transfer pricing risk.*

2.3.2 The Association Between Tax Convexity and Transfer Pricing Risk in Extended Tax Structures

Firms net operating losses can be recovered in vast majority of tax laws systems through provisions that allow firms to use prior or future tax expenses to offset current losses. These provisions allow firms to properly manage their losses, with loss carrybacks being preferred to loss carryforwards. For instance, Langenmayr and Lester (2018) show theoretically and empirically that loss carryback periods have a positive and greater effect

on corporate risk-taking as firms are allowed for an immediate tax refund from prior year's tax paid. The authors conclusions stand from a general corporate risk-taking and investment perspective. Conversely, from a transfer pricing risk strategy, overall reasoning may differ. For instance, Graham and Smith (1999) show that firms with current net operating losses have less incentives to hedge when future losses are expected since hedging not only reduces the "curvature" of a convex tax function, but also the likelihood of the firm to use such losses. Analogously, firms expecting to be profitable do have the incentive to hedge. In this context, we assume that transfer pricing risk follows a forward-looking perspective with overall purpose of smooth and structure present or future taxable income rather than take a risky approach to benefit from prior tax refunds.[6] For these reasons, we expect firms transfer pricing risk to have a positive association with the increase in loss carryforward periods. This drives us to the following hypothesis:

H2. *The increase in loss carryfoward periods is positively associated with transfer pricing risk.*

Further, Graham and Smith (1999) document that firms with net operating losses and significant amount of prior tax paid would experience different tax rates on a potential refund which generates "non-convex regions" in each year refund, reducing, therefore, the incentives for hedging. In this context and given previous assumption that transfer pricing strategies are forward-looking based, we expect the increase in loss carryback periods to have a negative association with transfer pricing risk. To examine this association, we formulate the following hypothesis:

H3. *The increase in loss carryback periods is negatively associated with transfer pricing risk.*

[6] In line with this view, the Canadian Revenue Agency (CRA, 2018), released a federal budget decree involving the extension period of reassessment on income arising from intragroup transactions. According to CRA (2018), this period extension relates to complexity in gathering relevant information between domestic and foreign affiliates for transfer pricing audits purposes.

2.4 Research Design

2.4.1 Data Source and Sample Selection

Our sample comprises a set of parent multinational firms located in the OECD political region[7] owning at least one worldwide foreign affiliated, for the period comprehended between 2010-2018. Given the particularities of a transfer pricing analysis, ownership requirements were assessed with greater detail from Orbis database (Bureau Van Dijk). The selected multinational firms (i) are the global ultimate owner of the foreign subsidiary[8], and (ii) own a direct or total percentage in its foreign subsidiary of at least 25%.[9] Unknown shareholders locations (*i.e.,* "n.a.") were excluded. Financial information is at the unconsolidated level. From an average initial sample of 61,915 firm-year, we eliminate firms missing industry identification (Nace rev.2; 2,775 firm-year), as financial and insurance firms (11,326 firm-year) given these industry particularities. Additionally, we exclude firms missing full ten-year period information (34,123 firm-year). Finally, we drop firms missing corresponding data to dependent variable (7,502 firm-year), arriving to a final set of 6,189 firm-year.

The selected dataset considers a period with relevant alterations in transfer pricing regulation, as the introduction of business restructuring section (chapter X) to "guidelines" in 2010[10], and BEPS (2015)[11] actions 8-10 focused in three main areas, (i) transactions involving intangibles, (ii), contractual allocations of risk, and (iii) profit allocation with no economic rationale. Complementary, our dataset is built on harmonized regulation, with countries following OECD transfer pricing guidelines, like other prior research approach using identical geographical areas (Devereux et al. 2002).

[7] Countries included: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, and United Kingdom.
[8] Ultimate Ownership is defined at, minimum of 50 % control from subject company to its ultimate, know or unknown shareholders.
[9] The 25% reference ownership was set according to benchmarking criteria, as defined by a vast majority of OECD countries on determining whether a firm is comparable for arm's length analysis.
[10]Edition containing substantial revisions. For more detail, please see: https://www.oecd-ilibrary.org/taxation/oecd-transfer-pricingguidelines-for-multinational-enterprises-and-tax-administrations-2010_tpg-2010-en
[11]For more detail, please see: https://www.oecd-ilibrary.org/taxation/beps-project-explanatory-statement_9789264263437-en

2.4.2 Dependent variable

Transfer Pricing Risk

As previously described, we show how transfer pricing strategies allow multinational firms to reduce overall tax liability. Despite the remarkable advances in transfer pricing law, multinational firms still find advantageous to take arbitrage positions on intragroup transactions, even despite the risk of tax authorities challenge intragroup terms and conditions.[12]

In this context, intra-group transactions must be priced at arm's length conditions or have a reasonable economic judgment behind its price or profit determination. If not, local tax authorities in the scope of their innovation and strength, will reassess the price or profits and determine the upward adjustment on tax liability. In this context, we measure transfer pricing risk (*TP_Risk*) by identifying each firm operating margin (OM) at risk due to transfer pricing.

Since the fraction of the global OM resulting from intragroup transactions is unknown, we use a common approach in the industry by taking the difference between the industry-year OM and each firm OM, to capture for any variation falling outside of arm's length range[13]. Accordingly, each firm transfer pricing risk is given as the product of the operating margin at risk (*OMR*) likely to be challenged by a tax authority given a certain probability, Pr (A).

$$TP_Risk = OMR*Pr\ (A) \tag{2.1}$$

The probability of an audit is exogenous and increases according to each country fiscal strength rule index (FSRI) profile, as developed in Deroose et al. 2006.[14]

[12] To determine whether an intragroup terms and conditions is at the arm´s length, transfer pricing analysis uses different methods that can be categorized (i) traditional transactional methods, also known as pricing methods, or (ii) transactional profit methods. Since pricing information regarding intragroup transactions is not publicly available, our analysis uses the transactional profit methods, particularly we apply a transactional net margin method with operating margin as profit level indicator.

[13] This relates to the reference range used by tax authorities in determining the true transfer price. The OECD guidelines (2017) defines it as "A range of figures that are acceptable for establishing whether the conditions of a controlled transaction are arm's length and that are derived either from applying the same transfer pricing method to multiple comparable data or from applying different transfer pricing methods."

[14] This methodology takes into consideration a score approach of five important criteria's, namely: (1) – statutory/legal base; (2) – binding character; (3) nature of the body monitoring the rules and correcting the mechanisms; (4) correction mechanism for rules deviations; (5) resilience to shocks or outside control events.

The magnitude of *OMR* is subject to critical factors when determining transfer pricing risk, therefore, this is a function of (i) the industry OM difference to each firm OM, (ii) the number of foreign affiliates located in low tax rates jurisdictions, compared to domestic parent tax rate, (iii) the statutory tax rate, and (iv) a penalty applicable on the operating margin adjustment. To illustrate how to arrive at the transfer pricing risk variable, we formulate the following equation:

$$OMR = (OMD * F * t) + p \quad (2.2)$$

where:

OMD is the absolute value resulting from the difference of the 1st and 3rd quartile industry OM, respectively, to each firm OM; *F* is the number of foreign affiliates located in low tax rates jurisdictions, compared to domestic parent tax rate; *t* represents the corporate tax rate; *p* relates to the country-level penalty on the operating margin adjustment.

2.4.3 Independent variables

Negative Income Correlation

According to Graham and Smith (1999) tax functions (i) close to zero, (ii) with greater volatility, or (iii) showing a negative serial correlation, increase firms' incentives to use hedging instruments. Regardless of the earning levels (i.e., turnover, EBITDA, or EBIT), authors had shown that hedging incentives does not differ substantially. For instance, in further research Graham and Rodgers (1999) applied two different measures (sales revenue and profit before tax) with qualitative results remaining consistent. In this context, our measure of convexity in core tax structures, is given by the negative income correlation (NIC) variable that takes the serial correlation coefficient from each firm turnover (2010-2018).

To accurately capture for the convexity effects of NIC, we then converted into a dummy variable of 1 those coefficients showing a negative value, 0 otherwise.

Loss Carryback and Carryforward

Tax loss carryback (*LCB*) and loss carryforward (*LCF*) variables in this paper are directly related to each country tax law on loss provisions. In line with Graham and Kim (2009) and Langenmayr and Lester (2018), our rationale for carryback and carryforward measurement is based on governments decision power to change such provisions, with the effect of those changes having a significant and direct impact on firm's tax risk. We measure *LCB* and *LCF* provisions as the length of statutory number of years in which operating losses can be used.

Control variables

In this study we use control variables like intangibles intensity (Intangibles), stock intensity (Stock), firm dimension (Size), firm financing options (Gear), return on equity (ROE), and consumer price index (CPI).

Intangibles represent a key risk factor in transfer pricing transactions. For example, German tax authorities, despite the robustness of economic analysis and effective documentation, very often challenge intragroup transactions involving intellectual property, classifying them as high risky (EY, 2018). Stock intensity captures the extent to which inventory substitutes capital intensity. High intense inventory firms are likely to report higher effective tax rates, which infers lower risk taken in planning transfer pricing strategies (Zimmerman, 1983; Richardson and Lanis, 2007). Size controls the complexity and risk that larger firms present in related business activities and fragmented business models, contrarily to smaller firms. Rego (2010) identified larger firms to be more competitive, once present greater resources and lower tax planning costs compared to smaller firms. Additionally, Dyreng et al. (2009) found larger firms to report greater tax discrepancies on its effective tax liability. Gear controls firms reporting high debt levels, which according to Dyreng et al. (2008) consubstantiates the most preferential form of financing for firms operating in jurisdictions with high statutory tax rates. At this level, multinationals tend to present greater risk profile, as intragroup debt policies take arbitrage opportunities to report high tax deductions in advantageous tax jurisdictions. Lately, ROE looks after profitable firms planning for mispricing intragroup transactions by increasing (decrease) profits in low (higher) tax jurisdictions. CPI measures for consumer index prices trends likely to affect the relation between tax convexity and

negative income correlation on transfer pricing risk. Control variables are all winsorized at 1 percent and 99 percent, with exception of CPI.

2.4.4 Base Ordinary Least Squares (OLS) Regression Model

We test the association of negative income correlation, loss carrybacks, and loss carryforwards, on transfer pricing risk by employing the following model:

$$TP_Risk_i = \alpha_0 + \beta_1 NIC_i + \beta_2 LCB_{ic} + \beta_3 LCF_{ic} + \beta_n X_i + \varepsilon_i , \quad (2.3)$$

where:

TP_Risk stands for the transfer pricing risk in firm i; *NIC* is a dummy variable that equals 1 if firm i shows a negative serial correlated turnover, 0 otherwise; LCB is the statutory number of years allowed in country c in which operating losses can be carried back; similarly, LCF is the statutory number of years allowed in country c in which operating losses can be carried forward; X relates to a set of control variables, as discussed before; ε, identifies the error term.

2.5 Empirical Results

2.5.1 Descriptive Statistics

Table 2.1 (Panel A) presents the descriptive statistics of main variables in this study. Specifically, TP_Risk shows sample firms to score an average of 0,638 transfer pricing risk profile with a variation between the 5th and 95th percentile of -0,223 to 1,295, respectively (i.e., since upper limit is far distant from 0, it suggests that greater fraction of sample firms faces medium/high transfer pricing risk). On other hand, *NIC* indicates that sample firms show, on average, a positive serial correlated tax function of approximately 0,100. The median loss carryforward period for sample firms is 17 years, whereas carryback periods shows a zero median. Table 2.1 (Panel B) shows the sample observation distribution across OECD countries, the average statutory tax rate (2010-2018) for domestic firms, and the median of loss carryforward and carryback periods. Countries observations are reasonable distributed, exception made to greater economies, such as, Italy, France, and Spain. On the other hand, countries average statutory tax rate (2010-2018) is about 24,61%, with France and Belgium registering the highest rates, 36,83% and 33,99%, respectively.

Table 2.1- Panel A: Descriptive Statistics

Multinationals	**n**	**Mean**	**Median**	**Std. Dev.**	**5% Perc.**	**95% Perc.**
TP_Risk	6 1890	0,638	0,620	0,502	-0,223	1,295
NIC	6 1890	0,100	0	0,300	0	1
LCF	6 1890	15	17	5	5	17
LCB	6 1890	0	0	0	0	1
TaxAsymm	6 1890	0,029	0,020	0,075	-0,072	0,150
Intangible	6 1890	0,027	0,005	0,061	0,000	0,138
Stock	6 1890	0,159	0,131	0,150	0,000	0,447
Size	6 1890	4,026	4,039	0,719	2,804	5,210
Gear	6 1890	0,818	0,451	0,973	0,005	2,893
ROE	6 1890	0,132	0,103	0,174	-0,073	0,438
C_Price	6 1890	1,407	1,235	0,416	1,119	2,111

Variables definitions are presented in detail in appendix (A)

Panel B: Description of Country Statistics, Statutory Corporate Tax Rate, and Loss Offset Provisions

	Multinational		**Combined Statutory Tax Rate 2010-2018**	**LCF**	**LCB**
Country	**#obs**	**%**	**Average (%)**	**N.º Years**	
Austria	14	0,23	25,00	17	0
Belgium	425	6,87	33,99	17	0
Czech Republic	338	5,46	19,30	5	0
Estonia	28	0,45	20,70	17	1
Finland	46	0,74	23,30	10	0
France	811	13,10	36,83	17	1
Germany	32	0,52	29,62	17	1
Greece	31	0,50	25,30	5	0
Hungary	152	2,46	18,20	5	0
Ireland	12	0,19	12,50	17	1
Italy	2109	34,08	30,99	17	0
Luxembourg	17	0,27	28,84	17	0
Netherlands	5	0,08	25,15	6	1
Norway	118	1,91	27,10	17	0
Poland	22	0,36	19,00	5	0
Portugal	363	5,87	29,10	5	0
Slovakia	279	4,51	20,50	4	0
Slovenia	76	1,23	18,80	17	0
Spain	843	13,62	28,80	17	0
Sweden	166	2,68	24,32	17	0
Turkey	6	0,10	20,00	5	0
United Kingdom	296	4,78	24,00	17	1
Total	**6189**	**100**	**24,61%**		

2.5.2 Regression Results

Table 2.2 presents the OLS coefficients determining the association between of transfer pricing risk and core/extended tax structures. Column (1) shows for the average firm in our sample that *NIC* is associated with 6,74% higher transfer pricing risk (coefficient:

0,043). Thus, H1 is supported: negative income correlation is positively associated with transfer pricing risk. Similarly, column (2) suggests for the average firm that one tax period loss carryforward extension is positively and significantly associated with 6,74% higher transfer pricing risk (coefficient: 0,043). In this context, H2 is supported: the increase in loss carryfoward periods is positively associated with transfer pricing risk. . On other hand, column (3) shows that for the average sample firm, one tax period carryback extension is associated with 7,99% lower transfer pricing risk (coefficient: -0,051). This supports H3: the increase in loss carryback periods is positively associated with transfer pricing risk.

To examine for consistency, column (4) takes all explanatory variables into equation. Overall, the results remain in line with prior findings.

Table 2.2 - Association between Transfer Pricing Risk and Core/Extended Tax Structures

Variables	*Dependent variable: TP_Risk*			
	(1)	(2)	(3)	(4)
NIC	0,043**			0,048***
	(0,019)			(0,017)
LCF		0,043***		0,048***
		(0,001)		(0,001)
LCB			-0,051***	-0,180***
			(0,013)	(0,012)
Intangible	0,260***	-0,004	0,316***	0,175**
	(0,093)	(0,084)	(0,094)	(0,083)
Stock	-0,207***	-0,134***	-0,211***	-0,143***
	(0,038)	(0,035)	(0,038)	(0,034)
Size	-0,023***	-0,084***	-0,019**	-0,075***
	(0,008)	(0,007)	(0,008)	(0,007)
Gear	0,101***	0,082***	0,098***	0,069***
	(0,006)	(0,005)	(0,006)	(0,005)
ROE	-0,090***	-0,112***	-0,082**	-0,069**
	(0,033)	(0,030)	(0,033)	(0,029)
CPI	-0,494***	-0,359***	-0,488***	-0,326***
	(0,014)	(0,013)	(0,014)	(0,013)
C	1,375***	0,826***	1,368***	0,708***
	(0,038)	(0,037)	(0,038)	(0,037)
Control-effects	Yes	Yes	Yes	Yes
Industry-effects	Yes	Yes	Yes	Yes
p-value	[0,000]	[0,000]	[0,000]	[0,000]
Adjusted R^2	0,229	0,371	0,231	0,395
N	6 1890	6 1890	6 1890	6 1890

Table 2.2 uses an OLS regression to examine the association of negative income correlation and loss offset rules on firms transfer pricing risk. Columns (1) to (3) report the regression coefficients for core and extended tax structures variables, respectively. Column (4) presents the results from a regression including all main explanatory variables. Each regression estimate takes control-effects and industry fixed-effects. We present the model *p-value* in square brackets.
***, **, and * indicate statistical significance at 0.01, 0.05, and 0.1 level, respectively.
We present coefficient estimates *with standard error* in parenthesis. Variables definitions are presented in detail in table (1).

2.5.3 Alternative Tests

We extend our understanding about transfer pricing risk by examining its responsiveness in a context of investments with risky intangibles. Prior literature identified that difficulties in benchmarking "hard to-value" intangibles provide managerial agents the opportunity to explore tax benefits from IP regimes , which are taxed at very low rates on income arising from the transferred intangible (Shackelford et al. 2011). Accordingly, we study whether risky intangibles promote transfer pricing risk in firms facing high and low tax asymmetry. The riskiness of intangibles (INT_Risk) assumes that firms with R&D projects showing low capitalization and greater volatility are most likely to shift projects to foreign affiliates at an initial stage, which justifies a low-valuation price upon the sale.

For instance, Oswald (2008) showed that loss making firms are more propense to capitalize R&D expenditures, as so do firms with high earnings volatility. In this context, we measure INT_Risk by taking the coefficient of variation of intangibles for the period of 2010-2018.

This approach extends our knowledge from previous hypotheses, by assuming that multinational firms with long-run tendency for low and volatile R&D capitalization are more propense to engage in higher transfer pricing risk profile, mainly if (i) exposed to high tax asymmetry (TaxAsymm), measured as the difference between the average (2010-2018) statutory corporate tax rate of a parent firm and its foreign affiliates, or (ii) if foreign affiliates are located in advantageous IP regimes. We formally investigate for these assumptions by developing further hypotheses:

H4*. The effect of risky intangibles on transfer pricing risk is greater in firms with high tax asymmetry.*

H5. *The effect of risky intangibles on transfer pricing risk is greater in parent firms with foreign affiliates located in IP regimes.*

Table 2.3 shows the coefficients results from an OLS regression for risky intangibles effects on transfer pricing risk profile. Columns (1) and (2) show for every one percent increase in intangibles riskiness, transfer pricing risk increases 0,064 in firms with higher tax asymmetry, and decreases 0,051 in firms with low tax asymmetry, respectively. This

supports H4. Similarly, columns (3) and (4) shows that for every one percent increase in intangibles riskiness, transfer pricing risk increases 0,227 for firms located in IP-regimes, and decreases 0,051 in firms in non-IP regimes, respectively. However, the coefficient in non-IP regime shows no statistical significance, so we could not validate H5.

Table 2.3 - Alternative analysis: Association between Risky Intangibles and Transfer Pricing Risk

Variables	*Dependent variable: TP_Risk*			
	(1) High Asymmetry	(2) Low Asymmetry	(3)	(4)
INT_Risk	0,064***	-0,051**	0,227*	-0,051
	(0,024)	(0,028)	(0,116)	(0,072)
	[10,03%]	[-7,99%]	[35,58%]	[7,99%]
Stock	-0,212**	0,020	-0,529	-0,651**
	(0,087)	(0,106)	(0,327)	(0,305)
Size	-0,136***	-0,094***	-0,070	-0,191***
	(0,019)	(0,025)	(0,091)	(0,062)
Gear	0,088***	0,125***	0,064	0,098
	(0,011)	(0,015)	(0,065)	(0,065)
ROE	-0,137**	-0,215**	0,309	-0,163
	(0,074)	(0,090)	(0,315)	(0,194)
C_Price	-0,748***	-0,280***	-1,069***	0,390***
	(0,051)	(0,026)	(0,189)	(0,079)
C	2,339***	1,365***	2,315***	2,031***
	(0,097)	(0,116)	(0,411)	(0,342)
Industry-effects	Yes	Yes	Yes	Yes
Adjusted R^2	0,307	0,211	0,338	0,369
N	9340	9730	750	750

Table 2.3 shows transfer pricing risk responsiveness to risky intangibles in firms with negative income correlation, facing tax asymmetry, and with subsidiaries located in IP regimes. Column (1) and (2) identify those firms at the 75th and 25th quartile of tax asymmetry. Column (3) uses a set of firms with negative income correlation, facing tax asymmetry, and with subsidiaries located in IP regimes. Column (4) shows firms with opposite status, as column (3).
***, **, and * indicate statistical significance at 0.01, 0.05, and 0.1 level, respectively.
We present coefficient estimates with *standard error* in parenthesis. We show in squared brackets the economic significance effects from *INT_Risk* on *TP_Risk.*
Variables definitions are presented in detail in appendix.

In table 2.4, we disclose the results for additional robustness tests by considering alternative risk measures from existing literature. We use a logistic regression model to infer about the transfer pricing risk likelihood association with explanatory variables. In columns (1) to (7) we use a dummy variable to capture about the average difference between firm's ROA and industry-year ROA: it equals 1 if firm's *Risk_ROA* is below the industry-year average, 0 otherwise. Results show coefficients to remain consistent,

suggesting a positive and significant association between *Risk_ROA*, *NIC*, *TaxAsymm*, and interaction terms, *NIC*TaxAsymm*, and *LCF*TaxAsymm*. On other hand, results for *LCB* and *LCB*TaxAsymm* remain negative.

Similarly, *LCF* is positive associated with firm risk, however it shows no significance. In same spirit, columns (8) to (14) use *Risk_CashFlow* to capture cash flow riskiness given industry-year deviations. Overall, results are consistent with those reported in tables 2.2 and 2.3.

Table 2.4 - Alternative Analysis – Alternative Measures

Variables	*Dependent variables*													
	D_Risk_ROA							*D_Risk_Cash Flow*						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
NIC	0,282***							0,285***						
	(9,212)							(8,887)						
LCF		0,002***							0,017***					
		(0,145)							(6,921)					
LCB			-0,324***							-0,177***				
			(19,926)							(5,421)				
TaxAsymm				1,431***							0,818**			
				(14,445)							(4,484			
*NIC*TaxAsymm*					1,920*							1,154		
					(2,183)							(1,014)		
*LCF*TaxAsymm*						0,078***							0,047**	
						(11,421)							(3,948)	
*LCB*TaxAsymm*							-0,520							-0,927
							(0,643)							(1,389)
C	0,237***	0,247	0,202	0,159	0,255	0,174	0,303	-0,209	-0,406	-0,201	-0234	-0,178	-0,230	-0,119
	(1,492)	(1,383)	(1,076)	(0,661)	(1,734)	(0,791)	(2,401)	(1,005)	(3,183)	(0,920)	(1,228)	(0,729)	(1,185)	(0,318)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0,189	0,188	0,191	0,190	0,188	0,190	0,188	0,162	0,161	0,161	0,161	0,160	0,161	0,160
N	61650	61650	61650	61650	61650	61650	61650	57070	57070	57070	57070	57070	57070	57070

Table 2.4 shows alternative tests to main hypothesis. Columns (1) to (14) follow the rational from Table 2.3 and 2.4, but apply a logistic regression, as alternative measures of firms risk-taking used in prior literature (Reuer and Leibein, 2000; John et al., 2008; Langenmayr and Lester, 2018; Albertus et al., 2019). Columns (1) to (7) uses the ROA adjusted to industry-year average ROA. Columns (8) to (12) uses Cash-Flow. Control variables are included as in Table 2.3 and 2.4, exception made to ROE since multicollinearity problems may bias regression coefficients.

***, **, and * indicate statistical significance at 0.01, 0.05, and 0.1 level, respectively.

We present logistic coefficient estimates with *Wald* X^2 in parenthesis.

Variables definitions are presented in detail in appendix.

2.6 Conclusion

In this paper we examine how tax convexity in scenarios of progressive taxation (i.e., core tax structure) or other tax code provisions (i.e., extended tax structures) incentives transfer pricing risk in multinational firms. We use a sample of parent firms located across the OECD political region between 2010-2018. We show that convexity through negative income correlation (NIC) or the increase in loss carryforwards periods (LCF) to be positively associated with transfer pricing risk. On other hand, the increase in loss carryback periods (LCB) is negatively associated with transfer pricing risk. A possible reason for this outcome is provided by Graham and Smith (1999) that show "non-convex regions" often present in extended tax structures to encourage a reduction in hedging or other practices aiming to smooth taxable income.

Additionally, we study the effects of risky intangibles on transfer pricing risk. Empirical findings suggest that transfer pricing is more responsive to risky intangibles in firms with high tax asymmetry, compared to those with low tax asymmetry. Similarly, we found this behaviour to be consistent in firms located in IP regimes.

Our study provides strong empirical evidence for policymakers (such as, OECD, UN, and local governments) that want to regulate and reduce firm's propensity to explore transfer pricing risk strategies or transfer pricing rules misalignment. The findings resulting from this paper could possibly be monitored by corporate governance mechanisms (Klassen and Laplante, 2012; Guenther et al. 2017; Langenmayr and Lester, 2018; Albertus et al. 2019). In this respect, despite the recommend changes to OECD tax systems and transfer pricing legislation, firms' risk governance guidelines and procedures should also help in reducing transfer pricing risk. Therefore, we foresee the study how corporate governance at the country and corporate level affects transfer pricing risk an interesting avenue for research.

Appendix

Variable Definitions		
Variables	Description	Source
Country-Level		
LCF	Median statutory number of years which operating losses can be carried forward with reference to country-tax law (2010-2018).	PWC; EY
LCB	Median statutory number of years which operating losses can be carried back, with reference to 2019 country-tax law (2010-2018).	
CPI	Consumer price Index *per* country weights in percentage of OECD Total.	OECD
Firm-Level		
TP_Risk	TP_Risk = OMR*Pr (A) where: OMR = (OMD*F*t) + p, and *where*: TP_Risk: transfer pricing coefficient at risk; OMR: operating margin at risk; OMD: absolute value resulting from the difference of the 1st and 3rd quartile industry OM, respectively, to each firm OM; Pr (A): probability of transfer pricing audit according to each country fiscal strength rule index (FSRI) profile; F: is the number of foreign affiliates located in low tax rates jurisdictions, compared to domestic parent tax rate; t: corporate tax rate; *p:* penalty, at country-level, for transfer pricing adjustment.	Deroose et al. 2006
NIC	1 if ten-year (2010-2018) turnover serial correlation for *firm f* is negative, 0 otherwise.	Graham and Smith (2002)
Control variables		
Intangibles	Ratio of intangibles to total assets.	Orbis
Stock	Ratio of stock to total assets.	Orbis
Size	Logarithm of total assets.	Orbis
Gear	Ratio of Non-Current Liabilities plus Loans divided by Shareholders Funds.	Orbis
ROE	Ratio of net income to shareholder's equity	Orbis

Chapter 3

3 Transfer Pricing Risk and Corporate Governance: Evidence from OECD Countries

3.1 Introduction

International commerce has exposed transfer pricing to greater and controversial risks, a shift in which multinational firms and local tax authorities very often disagree or have opposite perspectives. This lack of consensus has heightened relevant developments in transfer pricing regulatory framework. Despite the improvements, regulation is more focused in compliance requirements that rather satisfy local tax authorities transfer pricing assessments. We explore this gap by examining how firm's internal governance structures control for transfer pricing risk. We define transfer pricing risk based on the assumption that multinational firms profit exposed to changes in interest rates increases intragroup financing to deviate from arm´s length principle. Also, we subject firms transfer pricing to identical risk management incentives (i.e., taxes, financial distress, and information asymmetry) based on seminal contributions from Smith and Stulz, (1985), Nance et al., (1993), and Graham and Smith (2002). By studying first how these determinants affect transfer pricing risk, and second, appealing to internal governance monitorization, makes inferences about the effects of corporate governance on transfer pricing risk more realistic and effective.

We perform an empirical analysis on previous assumptions in four stages. First, based in equation 2.1., we re-compute a transfer pricing risk model to capture for public-listed firms' profits exposure to changes in interest rates (i.e., 12M Euribor). To this end, our premise is that exogenous volatility of interest rates increases the probability of financing arrangements between the parent and its affiliates to disregard arm's length terms and conditions. To improve model inferences, we introduce two critical parameters. One that captures for differences between the parent and affiliate probability of default, and a second that takes the percentage of foreign affiliates with statutory tax rate above its parent firm.

The combination of these parameters, at a given probability, provides the transfer pricing risk exposure of each publicly listed firm identified in our sample. Second, we examine the effects of tax provisions (i.e., loss carryforward), bankruptcy (i.e., Altman Z-Score), asymmetric and information/ownership (i.e., manager/director ownership) on transfer pricing risk. Empirical results show that average transfer pricing risk is higher by 0,172 units in firms constrained by limited tax loss carryforward provisions than firms with unlimited periods to report prior losses. Similarly, the average transfer pricing risk is higher by 0,112 units for every firm showing robust financial health, compared to firms in financial distress scenarios. Moreover, the average transfer pricing risk increases by 0,037 units for every firm, majority owned, by manager/director's, compared to those with lower manager/director ownership.

Third, we examine the effects of internal governance mechanisms (i.e., board independence, presence of audit/risk/governance/ committees, institutional ownership, and mainstream accounting firms advisory) on transfer pricing risk. Empirical results show that average transfer pricing risk is lower by 0,143 units before the presence of independent directors, making this an effective mechanism to control. Similar results were found to other internal governance mechanisms, exception made to advisory by mainstream accounting firms that show average transfer pricing risk to be higher in 0,106 units, compared to non-mainstream accounting firms.

Fourth, we interact governance mechanisms on risk management. Empirical results show that independent directors, and audit/risk/governance committees are the most effective in reducing transfer pricing risk, mainly regarding tax provisions.

This paper makes contributions for the incipient research involving transfer pricing and corporate governance. Our study not only develops an explicit measure of transfer pricing risk, but also reports new empirical evidence in literature concerning tax avoidance, tax aggressiveness or profit shifting. For instance, Lanis and Richardson (2011; 2018) found that multinational firms with independent directors on board report less tax avoidance. Similarly, Richardson et al., (2015) and McClure et al., (2018) concluded that tax avoidance is responsive to financial distress as shareholders benefit in shifting risk to debtholders.

Our research paper differs from these as we approach, (i) transfer pricing risk differently from commonly used measures of tax avoidance or aggressiveness (i.e., effective tax rate or book tax differences) and (ii) apply a research strategy that allows inferences about the effects of internal corporate governance on transfer pricing risk to become more accurate.

Lately, our study informs governmental bodies and policyholders about risk fundamentals in the context of transfer pricing policies. Specifically, we clarify how internal governance mechanisms are critical in managing risk for transactions between related parties, which extends the tunnelled approach in most of transfer pricing frameworks. The chapter is structured as follows: section 3.2 provides an overview of prior literature relating transfer pricing and corporate governance. Section 3.3 presents relevant theory and formalized the hypotheses. Section 3.4 describes the research design. Section 3.5 presents the results and formulates alternative tests. At last, section 3.6 concludes.

3.2 Literature Review

The association between transfer pricing and corporate governance has been studied, most, from a tax avoidance or tax aggressiveness perspective. Despite the context, it forms part of an organization overall risk management theory that sets a reduction in expected taxes, bankruptcy costs, and agency costs as key drivers of firm's value maximization. (Smith and Stulz, 1985; DeMarzo and Duffie, 1991; Nance et al., 1993; Graham and Smith, 2002; and Graham and Rogers, 2002).

These drivers are consistent with Brealey et al., (2017), that contextualize various scenarios in which firm risks could be taken. Most interesting, is that these risks have an international exposure behind, that implicitly, can be managed by using aggressive transfer pricing strategies. Accordingly, the Australian stock exchange council for corporate governance (ASX) suggests firms to have, internal or external, effective risk management procedures that assure unforeseen risks, and preserve enterprise value.

In line with this, Fama (1980) suggests that independent directors in board structure may increase regulation and mechanisms that preserve shareholders' wealth. However, Fama and Jensen (1983) argue that internal agents' control and knowledge over firms induce top management functions to behave on its own benefit, not shareholders. On other hand, Lanis and Richardson (2011;2018) provide empirical evidence that firms with greater fraction of independent directors are less likely to engage in tax avoidance arrangements.

Similarly, audit committees at greater level of independency may assure the quality of financial statements. In this regard, Taylor and Richardson (2013) find in public-listed Australian firms that greater audit committee independency is associated with less tax avoidance. Moreover, Hsu et al., (2018) suggest that audit committees and independent financial experts show less propensity for tax avoidance.

Other critical factor defining a strong corporate governance is given in Badertscher et al., (2009) that find tax aggressive strategies to demand high professional consulting services taking benefit of worldwide networking. Further, McGuire (2012) suggests that tax avoidance is greater when auditors are also tax advisors given their transversal knowledge and global perspective across the organization.

3.3 Theory and Hypotheses

We draw our hypotheses, first, from risk management incentives to reduce taxes, bankruptcy costs, and asymmetric information and ownership. Second, we appeal for internal governance factors to monitor for the transfer pricing risk resulting from first-stage hypotheses. Following Kovermann and Velte (2019) our internal governance factors are mainly related to board of directors' structure, more specifically, board independence, presence of audit/risk/governance committees, institutional ownership, and presence of mainstream accounting firms.

3.3.1 Taxes

According to Zimmerman (1983) tax loss carryforward provisions make tax functions more convex, with firms recuring to hedging practices to reduce tax volatility. In same spirit, we assume that tax loss carryforward provisions with limited periods to be reported, will cause firms transfer pricing risk profile to become greater, as firms must anticipate profits in a limited period, otherwise liquation may apply. Thus, the following hypothesis is formulated:

H1. *Firms with limited tax loss carryfoward periods are positively associated with transfer pricing risk.*

3.3.2 Bankruptcy

Transfer pricing becomes relevant when a group affiliate faces bankruptcy, and earnings may not be at the arm's length for creditors. Since affiliated firm's ownership makes them

an extension of the parent company, we assume that corporate governance at the affiliate level is just overlooked or unnoticed, as final responsibilities are "insured" by the parent. Thus, we assume that parent firms at a relatively safe zone of distress are likely to greater transfer pricing risk since financial health allows greater "insurance" against underlying costs of affiliates bankruptcy (Rampini et al. 2014). This reasoning drives us to the following hypothesis:

H2. *Firms in financial strength are positively associated with transfer pricing risk.*

3.3.3 Information Asymmetry and Ownership

According to DeMarzo and Duffie, (1991), Géczy et al., (1997), information available for institutional shareholders and board directors is asymmetric. For example, many decisions and risks adopted about transfer pricing are taken at managerial level that holds proprietary information. On other hand, high managerial share ownership makes managers global wealth, and firms' value to become linear, as the former depends on the latter (Smith and Stulz, 1985). In fact, transfer pricing is commonly used to reduce overall tax burden and increase profits available for distribution. Thus, we predict that greater transfer pricing risk increases with greater information asymmetry and managerial share ownership. The following hypothesis is developed:

H3. *Higher managerial share ownership is positively associated with transfer pricing risk.*

3.3.4 Independent Directors

Board independence has been extensively studied in the context of multinational firms' value monitorization and preservation. For example, a report from Grant Thornton (2020) emphasized the importance of independent or non-executive directors to be critical in "flagging up" and identifying senior management misbehaviour. In same spirit, we assume the presence of independent board directors to reduce firms transfer pricing risk profile in a way that managerial decision-making becomes more prudent and ethical, and shareholders' interest protected (Lanis and Richardson, 2011). Based on this premise, we develop the following hypothesis:

H4. *The presence of independent directors on the board is negatively associated with transfer pricing risk.*

3.3.5 Audit/Risk/Governance Committee

The presence of internal audit, risk, and governance takes a transversal monitorization on preserving enterprise value. For instance, the audit committee assures the financial reporting quality and prevents from fraud scenarios. The risk committee oversees group risk management policies and global operations risk (i.e., transfer pricing), whereas the governance committee assures and promotes a healthy organizational functioning environment of the board of directors, and other committees. In this context, we believe the presence of any of these committees in multinational firms' board structures to be critical in sustaining their transfer pricing risk profile. Thus, we formulate the following hypothesis:

H5. *The presence of audit/risk/governance committees on the board is negatively associated with transfer pricing risk.*

3.3.6 Institutional Ownership

Prior literature defines institutional ownership as a relevant internal monitorization mechanism that controls and influences managerial decision (Jensen, 1993; Beasley, 1996). In this context, we assume that managers, frequently, may incur in risky transfer pricing strategies for self-benefit. However, this could be attenuated if firm's capital ownership is majority institutional. Accordingly, we formulate the following hypothesis:

H6. *Firms with higher institutional ownership are negatively associated with transfer-pricing risk.*

3.3.7 Mainstream Audit Firm

Transactions between affiliated firms are, most often, supported by skilled advisory teams. These take advantageous of extended networking firms across the globe that facilitates transfer pricing strategies to be successfully implemented (Badertscher et al., (2009). Conversely, Klein (2002), Tucker et al., (2002), suggest that multinational firms being audited by mainstream firms experience greater monitorization and higher audit quality. Given the ambiguity in prior studies, our hypothesis development is drawn from Miles and Snow (1978) framework and assumes that transfer pricing risk follows a cost leadership strategy based on tax minimization. Accordingly, we develop the following hypothesis:

H7. *Employment of mainstream audit firms is positively associated with transfer pricing risk.*

3.3.8 Interaction Effects Between Internal Governance and Transfer Pricing Risk

We extend prior literature by studying how the interaction of internal governance on risk management incentives reduces multinational firms transfer pricing risk profile. As mentioned previously, we expect the presence of independent directors, audit/risk/governance committees, and institutional owners to have greater monitorization effects in attenuating transfer pricing risk propensity to risk management incentives (i.e., taxes, bankruptcy). Accordingly, we formulate the following hypotheses:

H8. *The presence of independent directors or audit/risk/governance committee or institutional ownership decreases firms transfer pricing risk towards tax loss carryforward incentives.*

H9. *The presence of independent directors or audit/risk/governance committee or institutional ownership decreases firms transfer pricing risk towards financial strength incentives.*

3.4 Research Design

3.4.1 Data Source and Sample Selection

Our sample includes a set of public-listed firms across the OECD political region as defined in Orbis (Bureau Van Dijk) between 2010-2018. This timespan captures important changes in OECD transfer pricing guidelines, for instance: risk allocation in restructuring business, or BEPS actions 8-10. For an average initial sample of 74,925 firm-year, we control for missing values at industry level (Nace rev.2: 45 firm-year), exclude financial and insurance enterprises (11,943 firm year), missing information for complete sample period (35,172 firm-year). Finally, missing information to corresponding response variable (14,571 firm-year) were also excluded, arriving to a final set of 13,194 firm-year. Financial information on sample firms is at the consolidated level.

3.4.2 Dependent Variable

Transfer Pricing Risk

Our model follows common practices taken by holdings in intercompany financial transactions.[15] The risk involving such financing policies is regulated by policyholders and governments throughout the arm's length principle that requires a reasonable economic judgment behind pricing or profit determination. If not, local tax authorities, in the scope of their innovation and strength, will reassess the pricing or profits, and determine the upward adjustment on tax liability. Following this reasoning, our paper defines transfer pricing risk (*TP_Risk*) of each public-listed firm using three key parameters: (i) the exposure of firms operating margin to changes in interest rates (*OPM Exp*)[16], (ii) the difference between parent and foreign affiliates probability of default (*PoD*), and (iii) fraction of foreign affiliates with statutory tax rate above its parent (*FTaxForeign*). For those parent firms located in countries with high strength rule index (FSRI) profile (Deroose et al., 2006) [17] the probability *Pr(A)* of transfer pricing audit increases. To illustrate how to arrive at the transfer pricing risk variable, we formulate the following equation:

$$\text{TP_Risk} = (OPM_Exp + PoD + FTaxForeign) \times \Pr(A) \quad (3.1)$$

thus:

OPM_Exp stands for each firm operating margin exposure to interest rates. Following Zhang (2009), we computed each firm absolute value of estimated coefficient from a regression of annual operating margin percentage on the monthly percentage change in 12M Euribor; *PoD* is measured as the difference between the parent probability of default and the average probability of default for the set of affiliated firms in foreign jurisdictions. To control for bias, affiliated firms in same country were excluded from our analysis;

[15] For instance, guarantees, facilitated credit ratings, hedging on behalf, or back to-back hedging arrangements.

[16] This approach follows Zhang (2009), that used a regression of stock returns on changes in interest rates, foreign exchanges, and commodity prices. Instead, we applied firms operating margin so that our model follows common transfer pricing practices.

[17] This methodology takes into consideration a score approach of five important criteria's, namely: (1) – statutory/legal base; (2) – binding character; (3) nature of the body monitoring the rules and correcting the mechanisms; (4) correction mechanism for rules deviations; (5) resilience to shocks or outside control events.

FTaxForeign is the average number of foreign affiliates with statutory tax rate above its parent*; Pr (A)* captures the probability of a transfer pricing audit occur given each country fiscal strength rule index (FSRI). All in brackets parameters are in percentage.

3.4.3 Independent Variables

Risk Management Theory Variables

Our primary model includes variables that proxy for risk management incentives studied in Smith and Stulz (1985), Nance et al., (1993), Graham and Smith (2002), and Graham and Rogers (2002). Accordingly, for taxes we use loss carryforwards provisions (*LCF*), which are measured as a dummy variable of 1 for firms with limited loss carryforwards periods, 0 otherwise. In fact, we acknowledge that a limited timespan period to deduct losses stresses firms transfer pricing risk profile to increase compared to unlimited periods as risk management strategies may be diluted with no time constrains. For bankruptcy, we use the Altman Z-Score (*ALT_ZSCORE*) to measure firms' financial strength, as defined in Altman (1968). Finally, asymmetric information and ownership (*ASYMINFO_OWN*) is a dummy variable of 1 for firms with managers/directors owning a direct share above the sample third quartile, 0 otherwise.

Internal Corporate Governance Variables

In a second stage analysis, internal corporate governance variables include, independent directors (*BoD_IND*) which is computed as a dummy variable of 1 for firms with independent directors in their board composition, or any firm committee or department, 0 otherwise; on other hand, firms with audit, risk, or governance committees (*ARG_COMT*) are defined as a dummy variable of 1, 0 otherwise; the presence of institutional shareholders in firms capital ownership (*INST_OWN)* is defined as a dummy variable of 1 if institutional ownership is above the sample third quartile, 0 otherwise; and finally, mainstream accounting firms (*BIG4*) rendering advisory services are measured as the number of advisors in each firm sample period.

3.4.4 Control Variables

We control for other common factors often used in prior literature. To account firms' dimension and its effects on transfer pricing risk, we control for size (*SIZE*) by taking the

log of total assets; leverage (*LEV*) is computed as the ratio of long-term debt to total assets and captures firms' incentives to use debt.

From a transfer pricing perspective, parent firms with high debt levels are propense to allocate large amount of debt to affiliates in high tax jurisdictions so that pre-tax income is lowered; R&D intensity (*R&D_INT*) is measured as the ratio of intangibles to total assets. Intangibles are frequently in local tax authorities transfer pricing audit agenda given the easiness and properties of such assets to erode profits (Mutti and Grubert, 2008); lately, return on assets (*ROA*) is defined as the ratio of pre-tax profit to total assets, and controls for normal accruals estimates that, if mispriced, signal for earnings management strategies, (Cheng et al., 2016). Control variables are all winsorized at 10 percent and 90 percent.

3.4.5 Regression Models

We use an ordinary least square regression to examine about main hypotheses. First, we test for the effects of risk management incentives on transfer pricing risk as shown in *H1*, *H2,* and *H3*, accordingly:

$$TP_Risk_{it} = \alpha_0 + \beta_1 LCF_{it} + \beta_2 ALT_ZSCORE_{it} + \beta_3 ASYMINFO_OWN_{it} + \beta_n X_{it} + \varepsilon_{it}, \quad (3.2)$$

where:

TP_Risk stands for the transfer pricing risk in firm *i*, in *t* financial year (2010-2018), while explanatory variables are defined as shown previously; *X* relates to a set of control variables, as discussed before; ε, identifies the error term. In a second empirical test, we introduce internal governance measures, and examine for their effects on transfer pricing risk (*H4, H5, H6,* and *H7*). We re-compute model (4) to accommodate these changes as follows:

$$TP_Risk_{it} = \chi_0 + \chi_1 BoD_IND_{it} + \chi_2 ARG_COMT_{it} + \chi_3 INST_OWN_{it} + \chi_4 BIG4_{it} + \chi_n X_{it} + \varepsilon_{it}, \quad (3.3)$$

where, internal governance explanatory variables, the set of control variables, *X*, and the error term, ε, are defined as shown previously. The third test explores about the

effectiveness of internal governance in attenuating the effects of risk management incentive on transfer pricing risk, as formulized in H8 and H9:

$$TP_Risk_{it} = \lambda_0 + \lambda_1 LCF_i * BoD_IND_i + \lambda_2 LCF_i * ARGE_COMT_i + \lambda_3 LCF_i * INST_OWN_i + \lambda_4 ALT_ZSCORE_{it} * BoD_IND_i + \lambda_5 ALT_ZSCORE_{it} * ARGE_COMT_i + \lambda_6 ALT_ZSCORE_{it} * INST_OWN_i + \lambda_n X_{it} + \varepsilon_{it}, \quad (3.4)$$

3.5 Empirical Results

3.5.1 Descriptive Statistics

Table 3.1 - Panel A, indicates that for the average firm in the sample, transfer pricing risk (*TP_Risk*) is 0,242. In Panel B, variables in risk management incentives show that about 26% of sample firms have limited forward periods to report their losses (*LCF*), where about 27% show a strong and safe financial health, and about 25% have a manager or director with share ownership above the sample third quartile (6,3%). On other hand, corporate governance variables show that about 31% of firms have at least one independent director (*BoD_IND*) in their board structure. Similarly, about 47% of sample firms have in its structure an audit/risk/governance committee (*ARG_COMT*). Moreover, approximately 25% of firms are institutionally owned (*INST_OWN*) equal or above the sample third quartile (4,8%). Finally, about 76% of the sample firms are advised by mainstream accounting firms (*BIG4*). Panel C country statistics shows the United Kingdom, Germany, France, Sweden, and Poland to be amongst countries with greater representation in our sample. Countries with greater governance, usually Denmark, Finland, Norway, Sweden, Germany, Netherlands, Luxembourg, and Switzerland represent about 40 percent of sample, while the remaining account for 60 percent. Allowing for such a balanced sample structure, regression estimates increase in reliability and robustness.

Table 3.1. Descriptive Statistics

Panel A – Continuous Variables

Variables	N	Mean	Median	Std. Dev.	1.Q.	3.Q.
TP_Risk	13 194	0,242	0,112	0,304	0,030	0,364
SIZE	13 194	6,589	6,577	0,780	5,954	7,268
LEV	13 194	0,153	0,135	0,119	0,051	0,228
R&D_INT	13 194	0,188	0,144	0,159	0,047	0,311
ROA	13 194	0,045	0,048	0,050	0,015	0,083

Panel B – Dummy Variables

Variables	N	Firms	Mean	Std. Dev.	1.Q.	3.Q.
LCF	13 194	380	0,259	0,438	0	1
ALT_ZSCORE	13 194	401	0,274	0,446	0	1
ASYMINFO_OWN	13 194	367	0,250	0,433	0	1
BoD_IND	13 194	447	0,305	0,461	0	1
ARGE_COMT	13 194	684	0,467	0,499	0	1
INST_OWN	13 194	367	0,250	0,433	0	1
BIG4	13 194	1120	0,764	0,424	0	1

Panel C – Country Statistics

Country	#obs	Percentage (%)
Austria	23	1,569
Belgium	29	1,978
Czech Republic	4	0,273
Denmark	40	2,729
Estonia	9	0,614
Finland	60	4,093
France	161	10,982
Germany	192	13,097
Greece	45	3,070
Hungary	7	0,477
Iceland	6	0,409
Ireland	16	1,091
Italy	83	5,662
Luxembourg	11	0,750
Netherlands	35	2,387
Norway	29	1,978
Poland	102	6,958
Portugal	21	1,432
Slovakia	1	0,068
Slovenia	6	0,409
Spain	50	3,411
Sweden	132	9,004
Switzerland	82	5,593
Turkey	17	1,160
United Kingdom	305	20,805
Total	**1466**	**100**

3.5.2 Multivariate Results

Table 3.2[18] presents the regression results for the effects of risk management incentives on transfer pricing risk. Column (1) suggests that firms with limited tax loss carryforward provisions show higher transfer pricing risk, by 0,172 units, compared to those with unlimited tax periods to report prior losses. To this end, H1 is supported: firms with limited tax loss carryfoward periods are positively associated with transfer pricing risk. Column (2) shows that average transfer pricing risk is higher, by 0,112 units, in firms with strong financial health compared to those with a weak financial position. In line with Rampini et al. 2014, firms with strong financial status are more likely to "insurance" affiliates against other various costs, for example, bankruptcy. This supports H2: firms in financial strength are positively associated with transfer pricing risk. Column (3) shows that average transfer pricing risk is higher, by 0,037 units, in firms mainly owned by managers/directors. Accordingly, H3 is supported: higher managerial share ownership is positively associated with transfer pricing risk. Column (4) presents the coefficients including all explanatory variables, with overall results remaining positive and significant, exception made to *ASYMINFO_OWN* that despite remain a positive effect on transfer pricing risk, loses significance.

Table 3.2 - Effects of Risk Management Factors on Transfer Pricing Risk

Variables	*Dependent variable: TP_Risk*			
	(1)	(2)	(3)	(4)
LCF	0,172***			0,170***
	(0,018)			(0,018)
ALT_ZSCORE		0,112***		0,107***
		(0,022)		(0,021)
ASYMINFO_OWN			0,037**	0,003
			(0,019)	(0,019)
C	-0,288***	-0,281***	-0,255***	-0,356***
	(0,067)	(0,070)	(0,072)	(0,071)
Control-effects	Yes	Yes	Yes	Yes
Country-effects	Yes	Yes	Yes	Yes
p-value	[0,000]	[0,000]	[0,000]	[0,000]
Adjusted R^2	0,096	0,053	0,039	0,110
N	13 194	13 194	13 194	13 194

Table 3.2, columns (1) to (3) report the regression coefficients for tax loss carryforwards provisions, Altman Z-Score, and information asymmetry and ownership, respectively. Column (4) presents regression coefficients for all main explanatory variables.
***, **, and * indicate statistical significance at 0.01, 0.05, and 0.1 level, respectively.
We present coefficient estimates with standard error in parenthesis.
Variables definitions are presented in detail in appendix.

[18] In untabulated tests, we show that results remain consistent, at lower significance, with those from table 3.2 to 3.4, using a simplified version of the main transfer pricing risk model formulated as: TP_Risk = *OPM_Exp* x Pr (A)

Table 3.3[18] presents the effects of internal corporate governance on transfer pricing risk. Column (1) shows that average transfer pricing risk is lower, by 0,143 units, in firms with independent directors in their board structure than those with no independent directors in the board. Thus, H4 is supported: the presence of independent directors on the board is negatively associated with transfer pricing risk. Column (2) suggests that transfer pricing risk is lower, by 0,042 units, in the presence of audit, risk, or governance committees. Thus, H5 is supported: the presence of audit/risk/governance committees on the board is negatively associated with transfer pricing risk. Similarly, column (3) shows that average transfer pricing risk is lower, by 0,048 units, in firms majorly institutionally owned, which is line with Jensen, (1993), and Beasley, (1996). Thus, H6 is supported: firms with higher institutional ownership are negatively associated with transfer pricing risk. Column (4) identifies that average transfer pricing risk is higher, by 0,106 units, in firms advised by *BIG4*. Thus, H7 is supported: employment of mainstream audit firms is positively associated with transfer pricing risk.

Table 3.3: Effects of Internal Governance on Transfer Pricing Risk

Variables	*Dependent variable: TP_Risk*				
	(1)	(2)	(3)	(4)	(5)
BoD_IND	-0,143***				-0,141***
	(0,017)				(0,018)
ARGE_COMT		-0,042**			-0,021
		(0,016)			(0,017)
INST_OWN			-0,048**		-0,051**
			(0,021)		(0,021)
BIG4				0,106***	0,106***
				(0,021)	(0,021)
C	-0,314***	-0,244***	-0,119	-0,117	-0,136*
	(0,069)	(0,070)	(0,081)	(0,071)	(0,080)
Control-effects	Yes	Yes	Yes	Yes	Yes
Country-effects	Yes	Yes	Yes	Yes	Yes
p-value	[0,000]	[0,000]	[0,000]	[0,000]	[0,000]
Adjusted R^2	0,080	0,041	0,040	0,053	0,100
N	13 194	13 194	13 194	13 194	13 194

Table 3.3, columns (1) to (4) show the coefficients from an OLS regression using the variables: independent directors, audit/risk/governance committee, institutional ownership, and mainstream audit firms, respectively. Column (5) uses all main explanatory variables.
***, **, and * indicate statistical significance at 0.01, 0.05, and 0.1 level, respectively.
We present coefficient estimates with standard error in parenthesis.
Variables definitions are presented in detail in appendix.

Table 3.4[18], columns (1) to (3) show how independent directors, audit/risk/governance committees, and institutional ownership attenuate multinational firms transfer pricing risk profile before limited tax loss carryforward incentives. Coefficient estimates for *LCF*BoD_IND* generate the higher and statistically significant reduction effect on transfer pricing risk (-0,093)[19]; for *LCF*ARG_COMT* results are similar, but with little effects on transfer pricing risk (-0,006) [19]; lately, *LCF*INST_OWN* shows a weak and statistically not significant monitorization effect on transfer pricing. We conclude that only the presence of independent directors or audit/risk/governance committee, substantially, decrease firms transfer pricing risk towards tax loss limited carryforward incentives, therefore, we reject H8. In columns (4) to (6) we apply identical rationale, but instead use the financial strength incentive. Results for *ALT_ZSCORE*BoD_IND* show a statistically significant reduction on transfer pricing risk (0.226)[20]; for coefficients *ALT_ZSCORE*ARGE_COMT* and *ALT_ZSCORE*INST_OWN*, we also see a decrease in transfer pricing risk, however these are not statistically significant. Thus, is reasonable to conclude that only the presence of independent directors decreases firms transfer pricing risk towards financial strength incentives, therefore, we reject H9.

[19] Difference to LCF coefficient in table 2.
[20] Difference to ALT_ZSCORE coefficient in table 2.

Table 3.4: Interaction Effects of Risk Management Incentives and Internal Governance on Transfer Pricing Risk

Variables	*Dependent variable: TP_Risk*					
	(1)	(2)	(3)	(4)	(5)	(6)
*LCF*BoD_IND*	0,079**					
	(0,034)					
*LCF*ARGE_COMT*		0,166***				
		(0,025)				
*LCF*INST_OWN*			0,025			
			(0,030)			
*ALT_ZSCORE*BoD_IND*				-0,114***		
				(0,031)		
*ALT_ZSCORE *ARGE_COMT*					0,031	
					(0,025)	
*ALT_ZSCORE *INST_OWN*						0,051
						(0,046)
C	-0,208***	-0,168**	-0,228***	-0,217***	-0,214***	-0,228***
	(0,069)	(0,069)	(0,072)	(0,069)	(0,069)	(0,071)
Control-effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-effects	Yes	Yes	Yes	Yes	Yes	Yes
p-value	[0,000]	[0,000]	[0,000]	[0,000]	[0,000]	[0,000]
Adjusted R^2	0,040	0,064	0,037	0,046	0,038	0,037
N	13 194	13 194	13 194	13 194	13 194	13 194

Table 3.4, columns (1) to (3) detail the interactive effects between loss carryforwards and independent directors, or audit/risk/governance committees, or institutional ownership. Columns (4) to (6) apply identical approach but instead uses Altman Z-Score, with internal governance variables remaining constant.
***, **, and * indicate statistical significance at 0.01, 0.05, and 0.1 level, respectively.
We present coefficient estimates with standard error in parenthesis.
Variables definitions are presented in detail in appendix.

3.5.3 Alternative Tests

We reinforce the significance of previous results by developing two additional tests. First, we hypothesize about the possibility of transfer pricing risk be driven by unexpected factors (*i.e.*, organizational risk policies, tax laws, etc.,) that would bias overall results. We base our approach on Chen et al., (2018), and use the residuals from eq.(3.2) as dependent variable to regress these on internal governance exploratory variables. Table 3.5, columns (1) and (2), show that estimates coefficients remain consistent with those from table (3), and prior literature (Richardson et al., 2015; Hsu et al., 2018; and Lanis and Richardson, 2018).

Table 3.5: Alternative Analysis – Inferences about Unexpected Effects on Transfer Pricing Risk

Variables	*Dependent variable: TP_Risk Residuals*	
	(1)	(2)
BoD_IND	-0,123***	-0,015***
	(0,017)	(0,003)
ARGE_COMT	-0,019	-0,005
	(0,016)	(0,003)
INST_OWN	-0,049**	-0,348**
	(0,020)	(0,145)
BIG4	0,117***	0,021**
	(0,020)	(0,010)
C	0,100	0,015
	(0,081)	(0,082)
Control-effects	Yes	Yes
Country-effects	Yes	Yes
p-value	[0,000]	[0,000]
Adjusted R^2	0,057	0,016
N	13 194	13 194

Table 3.5, column (1) shows the coefficients results from an OLS regression using the residuals from eq. (3.2) as dependent variable. Column (2) replicates the procedure of column (1), however the explanatory variables are measured as continuous, instead of dummy variables. For robustness, control variables include also risk management incentives variables, tax loss carryforwards, Altman Z-Score, or information asymmetry and ownership.
***, **, and * indicate statistical significance at 0.01, 0.05, and 0.1 level, respectively.
We present coefficient estimates with standard error in parenthesis.

Secondly, we examine about firm's probability of making a change from low/medium to high transfer pricing risk profile [21] given its internal corporate governance characteristics. We use a multinomial regression (Hosmer and Lemeshow, 2000) framework and defined three risk profiles, *j = 3*. The reference group includes firms at the highest transfer pricing risk, *j = 0*, while the first and the second groups include firms at the lowest and medium transfer pricing risk, *j = 1* and *j = 2*, respectively. Thus, the probability of each firm belonging to profile, *j*, is given by internal corporate governance characteristics.

In table 3.6, column (1), coefficients suggest that, firms with *BoD_IND* (0), comparatively to *BoD_IND* (1), the multinomial *log-odds*[22] of presenting a low transfer pricing risk profile to high risk profile is expected to decrease by 1,046 (p = 0,000). Accordingly, in *odds ratio*[23] this means less 64,9% chances. For *ARG_COMT* the *odds ratio* also shows less 1,7% chances of firms having low transfer pricing risk, however, coefficients do not offer enough reliable statistical significance.

[21] Transfer pricing risk profiles are given as, low, medium, or high for each sample firm according to percentiles intervals of < 0,33; 0,33 to 0,66; and > 0,66, respectively.
[22] *Log-odds* is the estimated coefficient resulting from the logarithm (ln) of *odds ratio.*
[23] In a multinomial regression the *odds ratio* represents the probability of an event in one group to succeed given a nominated reference group.

For *INST_OWN* (0), compared to *INST_OWN* (1), the *log-odds* of presenting a low transfer pricing risk profile to high risk profile would be expected to decrease by 0,376 (p = 0,045). Given the *odds ratio*, this means less 31,4% chances. In column (2) *log-odds* and *odds ratio* for firms with medium transfer pricing risk profile remain consistent with those from column (1). Overall model fitting is robust as shown by the *chi-square* ($G^2(20)$ = 298,248; p = 0,000).

Table 3.6: Alternative Analysis – Multinomial Regression

	Dependent variable: TP_Risk Ordinal			
	(1) – Low Risk		(2) – Medium Risk	
Variables	Coefficient Estimates (β_j)	Odds Ratio (*Exp* β)	Coefficient Estimates (β_j)	Odds Ratio (*Exp* β)
BoD_IND	-1,046***	0,351***	-0,921***	0,398***
	(0,170)	[-64,9%]	(0,162)	[-60,2%]
ARGE_COMT	-0,017	0,983	-0,151	0,860
	(0,153)	[1,7%]	(0,147)	[-14,0%]
INST_OWN	-0,376**	0,686***	-0,331*	0,718**
	(0,188)	[-31,4%]	(0,197)	[-28,2%]
C	6,380***		2,059***	
	(0,744)		(0,731)	
Control-effects	Yes		Yes	
Country-effects	Yes		Yes	
Chi-square	[298,248]			
Nagelkerk R^2	0,207			
N	13 194			

Table 3.6, column (1) shows the estimate coefficients (log-odds) and odds ratio for firms with low transfer pricing risk profile. Column (2) replicates the analysis for firms with medium risk profiles. For robustness, control variables include also risk management incentives variables, tax loss carryforwards, Altman Z-Score, or information asymmetry and ownership.
***, **, and * indicate statistical significance at 0.01, 0.05, and 0.1 level, respectively.
We present coefficient estimates with standard error in parenthesis.

3.6 Conclusion

This research paper studies how internal governance structures are associated with multinational firms transfer pricing risk profile using a sample of firms located across the OECD political region between 2010-2018.

Main results suggest that independent directors, audit/risk/governance committees, or institutional ownership have a negative effect on transfer pricing risk, reducing, also, the impact on overall organization risk performance. When interacted with risk management incentives, the presence of independent directors seems to be the most effective internal governance factor reducing multinational firms transfer pricing risk profile.

In two alternative tests, we explore (i) the possibility of our transfer pricing risk be driven by unexpected factors, but also (ii) about governance effects changes across different transfer pricing risk profiles using a multinomial regression approach. First, we show that, despite the unknown factors impacting transfer pricing risk, internal governance mechanisms remain consistent and aligned with prior literature using alternative proxies to measure tax performance. Second, we provide strong empirical evidence that firms without internal governance mechanisms like, board independence or institutional ownership, compared to those with such board features, have less probability to presenting low transfer pricing risk, as opposed to high transfer pricing risk.

Our view is that empirical results have relevant implications for policyholders and governments to the extent that regulation has been mainly focused on compliance requirements. To this end, our paper shows that strong corporate governance structures allow for a consistent and reliable monitorization, increasing firms transfer pricing compliance and tax transparency. For this, we suggest policyholders and local governments to explore and hold on the inclusion of corporate governance characteristics in future transfer pricing regulation initiatives.

Looking forward, related with our paper, we foresee some research avenues to be explored. First, studying the particularities of corporate governance regulation, at country level, and how these interacts with transfer pricing: this should be of help to policymakers in identifying key drivers to sustain profit shifting and tax risk. Secondly, understanding and distinguishing organizational risk from transfer pricing perspective, would allow for greater effectiveness on designing and implementing policies. Finally, exploring how corporate governance committees monitor and oversee responsibilities on existing transfer pricing policies pressured by pandemic scenarios (*i.e.*, Covid-19). Note that these scenarios will challenge firms' boards structures to guarantee financial health and business prospects that should be aligned with internal transfer pricing policies.

Appendix

Variable Definitions

Variables	Description	Source
	Transfer Pricing Risk	
TP_Risk	TP_Risk = (OPM_Exp + PoD + FTaxForeign) x Pr (A) where: *TP_Risk:* transfer pricing risk coefficient; *OPM_Exp:* operating margin exposure to interest rates. It takes each firm absolute value of a coefficient from a regression of annual operating margin percentage on the monthly percentage change in 12M Euribor; PoD: difference between the parent probability of default and the average probability of default for the set of affiliated firms in foreign jurisdictions; *FTaxForeign*: average number of affiliated firms with statutory tax rate above its parent; *Pr (A):* probability of transfer pricing audit according to each country fiscal strength rule index (FSRI) profile;	Zhang (2009)
	Risk Management Incentives	
LCF	1 if firm *f* in country *c* has limited period to offset forwards prior losses, 0 otherwise;	PWC; EY
ALT_ZSCORE	1 if firm *f* Altman Z-Score is equal or above a Z-Score of three (3);	Altman (1968)
ASYMINFO_OWN	1 if firm *f* managers or directors direct share ownership is above the sample third quartile, 0 otherwise;	Orbis
	Corporate Governance	
BoD_IND	1 if firm *f* board structure, or any firm committee or department has independent directors, 0 otherwise;	Orbis
ARG_COMT	1 if firm *f* presents any of the audit, risk, or governance committees in its corporate structure, 0 otherwise;	Orbis
INST_OWN	1 if firm *f* shows institutional shareholders in their capital structure above the sample third quartile, 0 otherwise;	Orbis
BIG4	1 if firm *f* advisor is a mainstream accounting firm, 0 otherwise;	Orbis
	Control Variables	
SIZE	Logarithm of total assets;	Orbis
LEV	Ratio of long-term debt to total asset;	Orbis
R&D_INT	Ratio of intangibles to total assets;	Orbis
ROA	Ratio of pre-tax profits to total assets;	Orbis

Chapter 4

4 Do Investors Value Transfer Pricing Risk? Perspectives from External Corporate Governance and Transfer Pricing Regulation

4.1 Introduction

Transfer pricing represents a prime vehicle to shift profits across jurisdictions (Rampell, 2014; Salihu et al., 2015). To this end, international tax law has been developing extra efforts to regulate the complexity involving intra-group transactions and other strategies close to tax avoidance. Existing literature addressing this subject, examines corporate tax avoidance and its impact on stock prices (Kim et al., 2011), performance (Desai and Dhamapala, 2009), firms' reputational costs (Gallemore, et al., 2013), and costs of debt (Goh et al., 2016). However, evidence on whether transfer pricing risk drives investors' expectations remains unknown. Particularly, we contribute to existing literature by questioning if investors value transfer pricing risk, in a perspective that is consistent with other strategies increasing firm value (Rampell, 2014). Despite our primary focus be to study the effects of transfer pricing risk, we control for how tax avoidance is valued, so that investors differentiation between the two is captured. Subsequently, we appeal to country-level governance and transfer pricing regulation to examine whether investors valuation on transfer pricing risk and tax avoidance changes accordingly.

Transfer pricing strategies in prior literature are often examined in the scope of tax avoidance (Bartelsman and Beetsma, 2003; Sikka and Willmott, 2010; Taylor et al., 2015). However, many of the transfer pricing risk that firms show, may not always explore tax minimization or follow a sort of illegal outlines. For instance, firms may explore patent box regimes (often called IP regimes) offering lower tax rates on income deriving from patents or copyrights, and still report high levels of transfer pricing risk.

In fact, Neuman (2016) argues that sustainability is key in tax planning. The author examined that firms may explore tax benefits for a single period, or reversely, be persistent in reporting low tax rates. To this end, we found reasonable to dissociate tax avoidance and transfer pricing risk, as investors strategies to increase firm-value may differ accordingly. In fact, firms may achieve lower effective tax rates at different levels of transfer pricing risk.

Our study selects a sample of 12,150 (2010-2018) public-listed firms domiciled in the OECD political region. Data at firm-level (financial) was obtained from Orbis (Bureau van Dijk) database, whereas country-level information (corporate governance and transfer pricing indicators) was collected from World Bank and Ernst Young, respectively.

Empirically, we support previous assumptions by conducting three main tests. First, we examine whether investors valuation about transfer pricing risk is positive or negative. We study in detail for such valuation at different levels of transfer pricing risk. For comparison, we control for investors valuation about tax avoidance. Further, we explore whether a change in transfer pricing risk strengthens or attenuates investors valuation in firms before tax avoidance. Empirical results show that average investor valuation increases, by 0,283 units, for firms at highest level of transfer pricing risk. Contrarily, average investors valuation decreases, by 0,095 units, for firms at the lowest level of transfer pricing risk. Similarly, a unit change in transfer pricing risk increases investors valuation about tax avoidance.

In a second test, we examine about the role of corporate governance in monitoring investors valuation about transfer pricing risk. Following prior literature (Dittmar and Mahrt-Smith, 2007; and Pinkowitz et al., 2007) our view is that solid corporate governance policies are expected to mitigate abnormal levels of transfer pricing risk and tax avoidance. Overall, empirical estimates show that well governed countries are more effective in deterring investors valuation about transfer pricing risk and tax avoidance.

In a third test, we assess the effectiveness of transfer pricing regulation in monitoring investors valuation about transfer pricing risk and tax avoidance. Empirical results show that aggressive transfer pricing ruling offers better monitorization about investors valuation for high transfer pricing risk firms and tax avoidance.

This paper contribution stands mostly on international taxation and business valuation. First, we provide significant and robust empirical evidence on how investors value transfer pricing, defined at different risk levels. In this respect, we extend Desai and Dhamapala (2009) study on the effects between tax avoidance and firm-value, by showing that transfer pricing risk, as a tax strategy, should also be considered a relevant managerial action that investors should look at. Thus, we add to Desai and Dhamapala (2009) conclusions that "tax avoidance does not lead to increase in firm value", by providing evidence that firms at the highest percentile of tax avoidance do represent a positive and significant value for investors. Second, we extend prior literature about international taxation and tax risk. Specifically, we control for interactive effects of country regulatory factors (Langenmayr and Lester, 2018; Ljungqvist et al., 2017; and John et al., 2008), and also provide strong empirical evidence that investors valuation about transfer pricing risk is conditional to each country corporate governance environment and transfer pricing rules. Third, despite some prior literature (Dyreng et al., 2016; Hoopes et al., 2018) analyse how tax regulation and initiatives could improve firms' compliance and accountability, very few research approaches specify transfer pricing rules and measure how investors valuation is impacted. To this end, our contribution shows about the effectiveness of critical transfer pricing rule factors in mediating investors valuation from a risk perspective. Fourth, our findings clarify policyholders and governments that tax policies meant to be attractive for public budget purposes only, may be ineffective in capturing investment and business innovation. Specifically, we show how country governance environment and aggressive transfer pricing ruling are equally valued by investors upon deciding which business ecosystems favours most their wealth.

The remaining structure of the paper continues as follows: section 4.2 presents an overview of prior literature on transfer pricing risk and tax avoidance; section 4.3 discusses relevant theory and formalizes the hypotheses; section 4.4 presents the sample structure and research design; section 4.5 presents results and conducts additional tests; section 4.6 concludes.

4.2 Literature Review

4.2.1 Transfer Pricing

Prior references studying how taxation affects investors decision making started with Domar and Musgrave (1944). In same line, Fris et al., (2014) highlight the need to arm´s length and firms' overall business risk strategy be aligned, in a way that corporate value maximization is preserved. In fact, authors show in a conceptual framework how firms' risk should be interpreted in the context of transfer pricing. Based on these premises, a close approximation of how corporate tax risk can be assessed is provided by Neuman et al., (2019) through the identification of various sources of tax risk, such as, economic risk, uncertainty in tax law system, and poor information. In a more specific field of transfer pricing, Richardson et al., (2013) identify in a sample of Australian listed firms' various key determinants of transfer pricing aggressiveness (i.e., firm size, profitability, firm leverage, intangibles, multinationality, and tax havens). Subsequently, Taylor et al., (2015) examine that transfer pricing aggressiveness is responsive to multinationality of firms, tax havens, and intangibles assets.

Moreover, Richardson et al., (2013) concludes that transfer pricing aggressiveness, amongst other income shifting incentives, was positively associated with tax haven jurisdictions in a sample of U.S. firms. Recently, Klassen and Mescall (2018), developed a metric tailored to examine how premiums from cross border mergers and acquisitions are affected from changes in transfer pricing uncertainty. Authors find lower bid premium deals to be associated with higher transfer pricing risk.

4.2.2 Tax Avoidance

Prior literature is consensual about tax avoidance, defining this as intentional and abusive reduction in tax liability (Slemrod and Yitzhaki, 2000; Dyreng and Hanlon, 2008; Gravelle, 2013). Prior research on the effects of tax avoidance is ample and varies across different contexts. From a "positivist" perspective, an initial research version of Desai and Dharmapala (2009) analyse investors valuation about managerial strategies designed to minimize tax burden. Authors find no significant evidence that tax avoidance positively affects firm value. Moreover, Desai and Dharmapala (2009) show that firm-value in the presence of certain governance factors is positively associated to tax avoidance.

Similarly, Wilson (2009) identifies stock returns of firms engaged in tax avoidance strategies to be positively associated with those firms in healthy governance. In same hand, Inger (2014) shows that tax avoidance from stock options is also positively associated with an increase in firm-value. On other field of research, Frank et al., (2009), study the association between tax reporting and tax aggressiveness. Amongst other positive effects, authors find that aggressive financial reporting is strongly associated with tax aggressiveness. Moreover, authors show robust empirical evidence that markets tend to overprice tax aggressiveness.

On the other side of literature, several authors have identified a negative valuation by investors on tax avoidance strategies. An important study is given by Dyreng et al., (2016) that uses public scrutiny to evaluate firms tax avoidance behaviours. Empirical evidence suggest that benefits and costs of tax avoidance does change under such controlled environment. Similarly, Hanlon and Slemrod (2009) make clear that markets reaction to events on firms' tax avoidance is negatively, with emphasis to retail sector. Reputational consequences on firm-value and investors' expectations may also come at expansive cost.

4.3 Theory and Hypotheses

Our baseline hypotheses are focused on understanding, first, how investors value transfer pricing risk, second, whether strong governance environment influences investors valuation about transfer pricing risk and tax avoidance, third, we appeal to transfer pricing rules, and examine how effective these are in attenuating investors valuation about transfer pricing risk and tax avoidance.

4.3.1 Transfer Pricing Risk

Transfer pricing strategies involve stakeholders (*i.e.,* investors and tax authorities) with different perceptions about risk. Thus, firms may present different levels of transfer pricing risk that, naturally, complies with regulatory framework in place, or simply explore potential benefits/gaps existing there. Consistent with this assumption, Neuman (2016) argues that not all firms are likely to engage in strategies that would minimize tax. For instance, commodity risk related to market price fluctuations very often have a negative impact on firm performance. To this end, an appropriate transfer pricing policy that manages and guarantees more stable prices to overall group firms', certainly leads to an increase in investors wealth. On other hand, transfer pricing strategies taken

at managerial level could also take high risky forms, in a way that managers explore for high compensation benefits. This scenario is aggravated when managers have high share ownership in firms, or bonus are determined in firm after-tax performance, for instance. In fact, Smith and Stulz (1985) argue that managers global wealth and firms' value become a linear function of each other, with the former depending on the latter. To the extent that high levels of transfer pricing risk taken at managerial level also increase investors wealth, we formulate following hypothesis:

H1. *Investors have a positive valuation on transfer pricing risk.*

4.3.2 Interaction between Transfer Pricing Risk and Tax Avoidance

As shown previously, the study of tax avoidance effects across different scenarios has been done in prior literature. However, whether transfer pricing risk induces or reduces these effects has not yet been explored. Prior to "positivist" literature (Desai and Dhamapala, 2009; Wilson, 2009; Inger, 2014; Frank et al., 2009) that investors value tax avoidance, we expect transfer pricing risk to exponentiate this valuation. As exemplified previously, tax avoidance practices are not necessarily associated with high transfer pricing risk. For instance, Guenther et al., (2017) research is consistent with our intuition, and show that firms with low effective tax rates are not associated with greater tax risk. In this context, we preview that an increase in transfer pricing risk of firms in tax avoidance scenarios leads for greater investors valuation. This reasoning drives us to the following hypothesis:

H2. *An increase in transfer pricing risk increases investors valuation on tax avoidance scenarios.*

4.3.3 Governance and Transfer Pricing Regulatory Environment

We run an international empirical setting that explores how the heterogeneity of corporate governance policies and transfer pricing rules, at country-level, monitors for transfer pricing risk and tax avoidance. In line with Domar and Musgrave (1944), we assume that robust external corporate governance and transfer pricing ruling can attenuate the harmful effects of managerial actions.

In fact, our premise is that investors valuation about transfer pricing risk and tax avoidance is value decreasing in countries scoring higher governance. Similarly, we

expect severe transfer pricing ruling to hold investors valuation on transfer pricing risk. Given this rationale, our predictions are as follows:

H3. *Strong external corporate governance attenuates investors positive valuation on transfer pricing risk and tax avoidance.*

H4. *Severe transfer pricing ruling attenuates investors positive valuation on transfer pricing risk.*

4.4 Research Design

4.4.1 Data Source and Sample Selection

Our data sample is composed by public-listed firms located in the OECD political region, as drawn from Orbis (Bureau Van Dijk) over the period of 2010-2018. This time window allows us to accommodate important principles in corporate governance introduced by the OECD (2015) resulting from experts' contributions (i.e., World Bank Group). Moreover, following OECD (2015) initiative "Based Erosion and Profit Shifting" (BEPS), countries transposed to own corporate tax law important transfer pricing regulation changes (i.e., penalties and fee rules), with most of them taking place from 2016, onwards. We start with an initial sample of 74,925 firms-years. Following prior literature, we excluded firms missing information at industry level (Nace rev.2; 45 firm year), financial and insurance firms (11,943 firms' years), and missing information for complete sample period (35,172 firms-years). Finally, missing information to corresponding response variable (15,615 firms-years) were also excluded, arriving to a final set of 12,150 firms-years. Financial information on sample firms is at the consolidated level.

4.4.2 Regression Models and Variables

As mentioned previously, our initial hypotheses examine whether transfer pricing risk is positively valued by investors (H1), and whether an increase in transfer pricing risk increases investors valuation about tax avoidance (H2). We test for these assumptions by first, regressing investors valuation, proxied as *TobinQ*, on firms' different transfer pricing risk levels, *TPRisk High*, and *TPRisk Low*, respectively. Second, we analyse how transfer pricing risk interacts with firms before tax avoidance scenarios.

Following prior studies (Desai and Dharmapala, 2009), we control for investors valuation about tax avoidance (TA). These main assumptions are formalized in the following regression model:

$$TobinQ_{it} = \alpha_0 + \beta_1 TPRisk\ High_{it} + \beta_2 TPRisk\ Low_{it} + \beta_3 NONTA_{it} + \beta_4 TA_{it} + \beta_5 NONTA*TPRisk_{it} + \beta_6 TA*TPRisk_{it} + \beta_n X_{it} + \varepsilon_{it}, \quad (4.1)$$

where, *TobinQ* represents the median value from the ratio of market capitalization to total assets of firm *i*, in financial year *t* (2010-2018); *TPRisk* is defined as in equation (3.1), this is, the product of the operating margin at risk likely to be challenged by tax authority's given each country fiscal strength rule index profile; thus, *TPRisk High* and *TPRisk Low* are a dummy variable defined as 1 if firm *f* shows a transfer pricing risk above or below the industry 90th or 10th percentile, respectively, 0 otherwise; similarly, *NONTA* and *TA* are defined as dummy of 1 if firm *f* shows an effective tax rate (Gupta and Newberry 1997), above or below the industry 90th or 10th percentile, respectively, 0 otherwise; *X* relates to a set of control variables commonly used in literature, which includes, size (*SIZE*) defined as the log of total assets, leverage (*LEV*) computed as the ratio of long-term debt to total assets, and controls for firms' incentives to use debt; research and development intensity (*R&D_INT*) measured as the ratio of intangibles to total assets; and return on assets (*ROA*) defined as the ratio of pre-tax profit to total assets; ε, is the error term.

In a second stage, we appeal to country-level corporate governance policies (*H3*) and transfer pricing rules (*H4*) to monitor for high transfer pricing risk and tax avoidance. Accordingly, we employ an interaction term for *TP Risk* and *TA*, using several country-level corporate governance proxies as developed in Kaufmann et al. (2011), such as, control for corruption (*CTRL_Corruption*), regulatory control (*CTRL_Regulatory*), and rule of law (*Rule of Law*). These are formalized in the following regression model:

$$TobinQ_{it} = \chi_0 + \chi_1 TPRisk\ High*CTRLCorruption_{it} + \chi_2 TPRisk\ High*CTRLRegulatory_{it} + \chi_3 TPRisk\ High*Rule\ of\ Law_{it} + \chi_4 TA*CTRLCorruption + \chi_5 TA*CTRLRegulatory + \chi_6 TA*Rule\ of\ Law + \chi_n X_{it} + \varepsilon_{it}, \quad (4.2)$$

where, *CTRLCorruption* monitors about the perception of a country to excise public power and preserve private gain; *CTRLRegulatory* captures each country ability in developing and implement policies or regulation that promotes private investors; *Rule of Law* reflects investors' confidence in countries property rights, courts, police, or contract enforcement, for example. These worldwide governance indicators (WGI) are estimates showing each country governance performance level, varying from -2,5 (weak) to 2,5 (strong)[24]. Similarly, we construct two country-level transfer pricing rules likely to have a direct impact on firms' transfer pricing practices. Particularly, we capture for the likelihood of each local tax authority to proceed with a transfer pricing audit (*TP Audit*), as for the penalty exposure of each firm, according to country rule on submission failure, late submission, or deliberate and incorrect submission (*Penalty Exposure*). The regression model addressing this test is formulised as follows:

$$TobinQ_{it} = \lambda_0 + \lambda_1 TPRisk\ High*TPAudit_{it} + \lambda_2 TPRisk\ High*Penalty\ Exposure_{it} + \lambda_n X_{it} + \varepsilon_{it}, \quad (4.3)$$

where, *TPAudit* is a dummy variable of 1 if firm *f* is in a country whereas likelihood for transfer pricing audit is high, 0 otherwise; and *Penalty Exposure* is defined as 1 if firm *f* is in a country with specific penalty provisions in regulation for failure in transfer pricing documentation, 0 otherwise. In both regression models (4.2) and (4.3), variables such *TobinQ, TPRisk High*, and *TA*, as control variables, remain unchanged as presented in model (4.1).

[24] Please see Kaufmann et al. (2011).

4.5 Empirical Results

4.5.1 Descriptive Statistics

Table 4.1 shows the descriptive statistics for our data sample. Panel A and B presents the statistics for continuous and dummy variables. Panel C presents the country-level statistics. In detail, the mean (median) for *TobinQ* is 0,900 (0,671). Low *TobinQ* may suggests that the average (median) firm in the sample is before an undervalued scenario, Kaldor (1966). On other hand, the average (median) firm transfer pricing risk (*TPRisk*) in the sample is 0,236 (0,106). The average (median) *ETR* is 0,236 (0,228) showing a reasonable and harmonized tax liability for average sample firm. With regards to external governance indicators, overall, *CTRLCorruption*, *CTRLRegulatory*, and *Rule of Law* average and median statistics are below the strong performance estimator 2,5 as defined in Kaufmann et al., (2011). In Panel B, dummy variables *TPRisk High* and *TPRisk Low* show a balanced sample with the average percentage of firms at highest and lowest transfer pricing risk corresponding to 25,9% and 17,5%, respectively. Similarly, the percentage of sample firms in *NONTA* and *TA* corresponds to 17,0% and 10,6%, respectively. On other hand, transfer pricing rules show that about 78% percent of the sample countries are highly likely to conduct a transfer pricing audit, whereas, about 89% does have specific penalty provisions in place.

Panel C country statistics shows United Kingdom (19,8%), Germany (14,2%), France (13,7%), Sweden (9,1%), and Poland (7,5%) to be amongst the countries with greater representation in our sample.

Table 4.1- Descriptive Statistics

Panel A – Continuous Variables

Variables	n	Mean	Median	Std. Dev.	5.P.	10.P.
TobinQ	1 350	0,900	0,671	0,900	0,143	2,516
TPRisk	1 350	0,236	0,106	0,302	0,003	0,881
ETR	1 350	0,234	0,228	0,158	0	0,397
CTRLCorruption	1 350	1,617	1,738	0,585	0,368	2,227
CTRLRegulatory	1 350	1,499	1,703	0,389	0,766	1,815
Rule of Law	1 350	1,568	1,705	0,430	0,766	1,980
SIZE	1 350	6,720	6,739	0,763	5,416	7,718
ROA	1 350	0,051	0,052	0,047	-0,038	0,118
LEV	1 350	0,157	0,142	0,119	0,001	0,395
R&D_INT	1 350	0,199	0,158	0,167	0,002	0,487

Panel B – Dummy Variables

Variables	N	Firms/Countries	Mean	Std. Dev.	5.P.	10.P.
TPRisk High	1 350	350	0,259	0,438	0	1
TPRisk Low	1 350	236	0,175	0,380	0	1
NONTA	1 350	143	0,170	0,376	0	1
TA	1 350	230	0,106	0,308	0	1
TPAudit	1 350	1 055	0,781	0,413	0	1
Penalty Exposure	1 350	1 195	0,885	0,319	0	1

Panel C – Country Statistics

Country	#obs	Percentage (%)
Austria	31	0,023
Belgium	41	0,030
Czech Republic	5	0,004
Denmark	47	0,035
Estonia	2	0,001
Finland	63	0,047
France	185	0,137
Germany	192	0,142
Greece	46	0,034
Hungary	4	0,003
Iceland	3	0,002
Ireland	18	0,013
Italy	3	0,002
Luxembourg	13	0,010
Netherlands	42	0,031
Norway	37	0,027
Poland	101	0,075
Portugal	21	0,016
Slovenia	1	0,001
Slovakia	5	0,004
Spain	4	0,003
Sweden	123	0,091
Switzerland	84	0,062
Turkey	12	0,009
United Kingdom	267	0,198
Total	**1350**	**100**

4.5.2 Multivariate Results

Table 4.2 presents the estimate coefficients for regression model (4.1). In line with our premises, column (1) coefficient estimates are positive and significant, suggesting that average investor valuation increases, by 0,283 units, for firms at the highest transfer pricing level. Thus, H1 is supported: investors have a positive valuation on transfer pricing risk. Alternatively, column (2) coefficients show that average investor valuation decreases, by 0,095 units, for firms at lowest transfer pricing risk.

By taking this perspective into analysis, assumptions on hypothesis (1) are reinforced, with investors showing greater preferences for high transfer pricing risk levels. Columns (3) and (4) presents the exponential effects of transfer pricing risk in firms under tax avoidance (non-tax avoidance) scenarios. Accordingly, coefficient estimates are positive and statistically significant in both scenario. However, average investor valuation increases, by 0,556 (0,347) units, for each unit change in transfer pricing risk in firms under *TA* (*NONTA*) scenarios, respectively. In this context, H2 is supported: an increase in transfer pricing risk increases investors valuation about tax avoidance scenarios.

Finally, columns (5) and (6) presents the coefficients estimates comparison between firms in tax avoidance and non-tax avoidance scenarios. In line with prior studies showing a positive association between tax avoidance and investors valuation, we show that firms in tax avoidance are positively (0,238) and significantly valued by investors.

Table 4.2: Investors Valuation of Transfer Pricing Risk and Tax Avoidance

Variables	*Dependent variable: Tobin's Q*					
	(1)	(2)	(3)	(4)	(5)	(6)
TPRisk High	0,283***					
	(0,045)					
TPRisk Low		-0,095*				
		(0,054)				
*NONTA*TPRisk*			0,347*			
			(0,182)			
*TA*TPRisk*				0.556***		
				(0.140)		
NONTA					-0,015	
					(0,065)	
TA						0,238***
						(0,058)
C	0,700***	0,731***	0,615***	0,622***	0,635***	0,450**
	(0,181)	(0,192)	(0,184)	(0,182)	(0,184)	(0,188)
Control-effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-effects	Yes	Yes	Yes	Yes	Yes	Yes
p-value	[0,000]	[0,000]	[0,000]	[0,000]	[0,000]	[0,000]
Adjusted R^2	0,361	0,344	0,344	0,350	0,342	0,350
N	12 150	12 150	12 150	12 150	12 150	12 150

Table 4.2 reports results on investors valuation of transfer pricing risk and tax avoidance. Columns (1) and (2) report *OLS* regression coefficients of firms at the highest and lowest level of transfer pricing risk level, respectively. Columns (3) and (4) presents investors valuation on tax avoidance and non-tax avoidance firms, respectively, when transfer pricing risk changes. Columns (5) and (6) control for investors valuation on tax avoidance and non-tax avoidance firms.
***, **, and * indicate statistical significance at 0.01, 0.05, and 0.1 level, respectively.
We present coefficient estimates *with standard error* in parenthesis, and *model significance* in squared brackets.
Variables definitions are presented in detail in appendix.

Table 4.3 shows the results about the role of external corporate governance in monitoring investors valuation on high transfer pricing risk and tax avoidance. Column (1) to (3) coefficient results show a positive and significantly association between transfer pricing risk and investors valuation. However, given country-level governance controls, coefficient estimates on investors valuation are substantially reduced from those obtained in table (3). Particularly, a unit change in *CTRLCorruption* on firms with high transfer pricing risk reduces the way investors value high transfer pricing risk from 0,283 to 0,149, a decrease of 0,134. Similarly, for *CTRLRegulatory* and *Rule of Law* the decrease is 0,111 and 0,121, respectively. In columns (4) to (6) we expand our analysis and examined for corporate governance monitorization effects on firms reporting tax avoidance scenarios. Overall, all three governance indicators attenuate the positive and significant investors valuation about tax avoidance firms (table 4.2) from 0,238 to 0,115 (*CTRLCorruption*), 0,142 (*CTRLRegulatory*), and 0,131 (*Rule of Law*). In this context, H3 is supported: strong external corporate governance attenuates investors positive valuation on transfer pricing risk and tax avoidance.

Table 4.3: Interaction Effects of Transfer Pricing Risk, Tax Avoidance, and External Corporate Governance on Investors Valuation

Variables	*Dependent variable: TP_Risk*					
	(1)	(2)	(3)	(4)	(5)	(6)
*TPRisk High*CTRLCorruption*	0,149***					
	(0,023)					
*TPRisk High*CTRLRegulatory*		0,172***				
		(0,027)				
*TPRisk High*Rule of Law*			0,162***			
			(0,025)			
*TA*CTRLCorruption*				0,115***		
				(0,033)		
*TA*CTRLRegulatory*					0,142***	
					(0,037)	
*TA*Rule of Law*						0,131***
						(0,035)
C	0,711***	0,709***	0,713***	0,518***	0,484***	0,498***
	(0,181)	(0,181)	(0,181)	(0,186)	(0,186)	(0,186)
Control-effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-effects	Yes	Yes	Yes	Yes	Yes	Yes
p-value	[0,000]	[0,000]	[0,000]	[0,000]	[0,000]	[0,000]
Adjusted R^2	0,363	0,362	0,362	0,348	0,349	0,349
N	12 150	12 150	12 150	12 150	12 150	12 150

Table 4.3 reports the interaction effects between corporate governance, transfer pricing risk and tax avoidance on investors valuation. Columns (1) to (3) details the interactive effects of high transfer pricing risk firms and country-level governance factors (*control for corruption, control for regulatory quality, and rule of law*). Columns (4) to (6) apply identical approach but instead uses the interaction between firms in tax avoidance and external governance variables.
***, **, and * indicate statistical significance at 0.01, 0.05, and 0.1 level, respectively.

We present coefficient estimates with *standard error* in parenthesis, and *model significance* in squared brackets.
Variables definitions are presented in detail in appendix.

Table 4.4 presents empirical evidence on the interaction effects of firms at the highest transfer pricing risk level and (i) the likelihood of transfer pricing audit, and (ii) penalty exposure, on investors valuation. Column (1) suggests that firms with high transfer pricing risk located in countries with high likelihood to conduct a transfer pricing audit (*TPAudit*) report a decrease in investors valuation from 0,283 to 0,192, a reduction of 0,091. Similarly, column (2) shows that countries with specific penalty provisions (*Penalty Exposure*) for transfer pricing irregularities are more effective in controlling for high transfer pricing risk status, decreasing, therefore, investors valuation from 0,283 to 0,184, a reduction of 0,099. This empirical evidence supports H4: severe transfer pricing ruling attenuates investors positive valuation about transfer pricing risk.

In columns (3) and (4) we control for effectiveness of transfer pricing rules in monitoring investors valuation about tax avoidance firms. Overall results suggest that severe transfer pricing regulation reduces the positive and significant investors valuation about tax avoidance firms from 0,238 to 0,177 (*TPAudit*), and 0,142 (*Penalty Exposure*).

Table 4.4: Interaction Effects of Transfer Pricing Risk, Tax Avoidance, and Transfer Pricing Ruling on Investors Valuation

Variables	*Dependent variable: Tobin's Q*			
	(1)	(2)	(3)	(4)
*TPRisk High*TPAudit*	0,192***			
	(0,061)			
*TPRisk High*Penalty Exposure*		0,184***		
		(0,052)		
*TA*TPAudit*			0.177***	
			(0,063)	
*TA*Penalty Exposure*				0,225***
				(0,061)
C	0,656***	0,640***	0,508***	0,453***
	(0,186)	(0,183)	(0,188)	(0,189)
Control-effects	Yes	Yes	Yes	Yes
Industry-effects	Yes	Yes	Yes	Yes
p-value	[0,000]	[0,000]	[0,000]	[0,000]
Adjusted R^2	0,347	0,348	0,346	0,349
N	12 150	12 150	12 150	12 150

Table 4.4 reports the interaction effects between, transfer pricing risk, tax avoidance and transfer pricing ruling on investors valuation. Columns (1) to (2) details the interactive effects of high transfer pricing risk firms and country-level transfer pricing ruling (*likelihood for transfer pricing audit*, and *penalty exposure*). Columns (3) to (4) uses identical approach but instead uses the interaction between firms in tax avoidance and transfer pricing ruling.

***, **, and * indicate statistical significance at 0.01, 0.05, and 0.1 level, respectively.
We present coefficient estimates with standard error in parenthesis, and model significance in squared brackets.
Variables definitions are presented in detail in appendix.

4.5.3 Alternative Test

Persistence of Transfer Pricing Risk

First, we hypothesize about investors future valuation of transfer pricing risk, that most often rely on contemporaneous information. To the extent that transfer pricing risk is volatile[25], investors may struggle in keeping a continued level of valuation about transfer pricing risk in future. We examine for this initial implication by looking at two relevant aspects, first, whether different volatility levels (*i.e.*, 10%, 20%, and 30%) remain investors positive valuation on transfer pricing risk, and second, whether this incremental volatility in transfer pricing risk follows an increase or decrease, in investors valuation. We first, project transfer pricing risk using different levels of volatility and re-compute original *TPRISK* by imposing a 10%, 20%, and 30% increase in volatility.

Table (4.5), columns (1) to (3) show that despite the increase in *TPRISK* volatility, investors remain their valuation about transfer pricing risk positive and significant. However, results also show that, the greater the volatility in transfer pricing risk, the greater the decrease in investors valuation about transfer pricing risk. For instance, an increase in volatility from 10% to 20% results in 0,025 decrease in investors valuation about transfer pricing risk, approximately. Similarly, an increase in volatility from 20% to 30% results in 0,046 decrease in investors valuation about transfer pricing risk. We attribute these results to investors greater uncertainty in valuing consistent and continuous levels of transfer pricing risk.

[25] For instance, firms transfer pricing risk status may change after audits enforce some penalties.

Table 4.5: Additional Analysis: Persistence of Transfer Pricing Risk

Variables	*Dependent variable: Tobin's Q*		
	(1)	(2)	(3)
TPRisk_Vol.10%	0,301***		
	(0,056)		
TPRisk_Vol.20%		0,276***	
		(0,051)	
TPRisk_Vol.30%			0,255***
			(0,047)
C	0,531***	0,678***	0,678***
	(0,187)	(0,182)	(0,182)
Control-effects	Yes	Yes	Yes
Industry-effects	Yes	Yes	Yes
p-value	[0,000]	[0,000]	[0,000]
Adjusted R^2	0,347	0,356	0,356
N	12 150	12 150	12 150

Table 4.5 assesses the persistence effects of transfer pricing risk on investors valuation. Columns (1) to (3) measures transfer pricing risk persistence at different levels of risk volatility increase (10%, 15%, and 20%).
***, **, and * indicate statistical significance at 0.01, 0.05, and 0.1 level, respectively.
We present coefficient estimates with *standard error* in parenthesis, and *model significance* in squared brackets. Variables definitions are presented in detail in appendix.

Transfer Pricing Risk and Tax Avoidance Valuation by Investor Type

Second, we expand the understanding about the valuation of transfer pricing risk and tax avoidance from model (4.1). Particularly, this test is concerned about what type of investors value most transfer pricing risk and tax avoidance. Assuming that both explanatory variables are designed to minimize firms tax burden, we expect that high managerial share ownership (i.e., private) makes directors/managers global wealth and firms' value to become linear, as the former depends on the latter (Smith and Stulz, 1985). In this context, we apply a dummy variable of 1 to firms majorly owned by institutional investors (>50%), 0 otherwise; and a dummy variable of 1 to firms majorly owned by private investors (>50%), 0 otherwise. Accordingly, we conduct two different least square regressions on each of the sub-samples of institutional and private investors.

Table (4.6), columns (1) to (4) shows the results for institutional investors. In line with the outcomes from table 4.2, column (1) shows that average investors valuation is higher, by 0,282 units, in firms at the highest level of transfer pricing risk. Contrarily, column (4) shows that average investors valuation is lower, by 0,015 units, in tax avoidance firms.

Despite the result show low statistical significance, it recalls to prior studies arguing that tax avoidance may be costly for investors given their high reputational costs (Hanlon and Slemrod, 2009). On other hand, columns (5) to (8) show private investors valuation about *TPRisk*. Column (5) shows, not only, that average private investor valuation is higher, by 0,513 units, for firms at the highest level of transfer pricing risk, but also, that average valuation is greater in private investors. This outcome provides empirical evidence to Smith and Stulz, (1985) by showing that in firms majorly owned (>50%) by private investors, transfer pricing risk contributes significantly to their own global wealth.

Column (8) shows private investors to value less tax avoidance than institutional investors. Despite the result shows no statistical significance, prior literature (Hanlond and Slemrod, 2009) supports the premise that reputational costs could possibly have greater impact on private investors wealth so that tax avoidance strategies are less valued.

Table 4.6: Additional Analysis: Valuation of Transfer Pricing Risk and Tax Avoidance by Investor Type

Variables	*Dependent variable: Tobin's Q*							
	Institutional				*Private*			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
TPRisk High	0,282***				0,513***			
	(0,049)				(0,135)			
TPRisk Low		-0,102*				-0,185		
		(0,059)				(0,124)		
NONTA			0,240***				0,488***	
			(0,062)				(0,144)	
TA				-0,015				-0,115
				(0,069)				(0,182)
C	0,756***	0,800***	0,509***	0,701***	0,784	0,724	0,254*	0,534
	(0,201)	(0,212)	(0,208)	(0,204)	(0,517)	(0,544)	(0,522)	(0,530)
Control-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
p-value	[0,000]	[0,000]	[0,000]	[0,000]	[0,000]	[0,000]	[0,000]	[0,000]
Adjusted R^2	0,352	0,335	0,342	0,334	0,366	0,329	0,357	0,326
N	12 096	12 096	12 096	12 096	11 367	11 367	11 367	11 367

Table 4.6 reports results regarding investor valuation, by type, on transfer pricing risk and tax avoidance. Columns (1 to 4) presents the results for institutional investors, whereas column (5 to 8) includes private investors.
***, **, and * indicate statistical significance at 0.01, 0.05, and 0.1 level, respectively.
We present coefficient estimates *with standard error* in parenthesis, and *model significance* in squared brackets.
Variables definitions are presented in detail in appendix.

Other Robust Tests

We conduct additional tests[26] by exposing our main inferences to changes in exploratory variables. First, we examine whether book-tax-differences, as alternative to tax avoidance, are associated with investors valuation. Following prior literature (Revsine et al., 1999; Hanlon 2005) book-tax-differences are informative about accounting aggressiveness strategies, which may awake tax authorities for potential audits. Moreover, Joos et al., (2000) examined that book-tax-differences report low earnings quality in either directions. Thus, we use total and temporary book-tax-difference, as defined in Manzon & Plesko, (2002), and re-compute these as dummy of 1 for those firms with total or temporary book-tax-difference below or above the 10^{th} or 90^{th} industry percentile, respectively, 0 otherwise.

We find a positive and significant association (0,371) between total book-tax-differences and investors valuation. Results for temporary book-tax-differences follow same trend (0,032) but show no statistical significance. Second, we use *TPRISK* and *TA* as continuous variables, and alternate our baseline regression model (4.1). Coefficient estimates show *TPRISK* to remain positive and significant associated with investors valuation. Contrarily, results for *TA* present a negative and significant association with investors valuation.

4.6 Conclusion

In this chapter we are primarily concerned in examining investors valuation about transfer pricing risk and tax avoidance, and secondly, how country-level governance indicators and transfer pricing ruling impact investors preferences.

We consider a sample of firms located across the OECD political region for the period of 2010-2018. Reported, empirical evidence shows that investors have a positive and significant valuation about high levels transfer pricing risk. Should also be noted that changes in transfer pricing risk is more valued by investors in tax avoidance firms than non-tax avoidance firms. Our study also presents strong empirical evidence about country-level corporate governance indicators and transfer pricing ruling.

[26] Unreported results available on request.

Objectively, these monitorization policies sustain investors valuation about transfer pricing risk and tax avoidance from exploring strategies that would erode firm tax bases.

In alternative tests, we also show that (i) constant increase in transfer pricing risk volatility makes investors valuation to become uncertain and diminished, (ii) private investors value relatively more transfer pricing risk than institutional investors, (iii) tax avoidance is less valuable for private investors given the assumption that reputational costs are greater and significant in these type of businesses. (Hanlond and Slemrod, 2009; Hoopes et al., 2012).

This paper main conclusions provide support for policyholders and local tax authorities. To the extent that various policyholders, governments, and many other stakeholders claim for an effective regulation and reduction in firms transfer pricing risk underlying international investment, balanced and rationale policies between preserving investors wealth and increasing government income tax, may offer an appropriate measure of achieving these concerns. On other hand, our study also shows that such events are not circumcised to transfer pricing legislation, but also to corporate risk. For instance, strong corporate governance environments are important when making inferences about transfer pricing risk. In this context, our expectation is that beyond future research could extent the study about the effects of corporate governance (i) to different law frameworks in OECD political countries, and (ii) from a tax risk literature perspective which is still in early stage.

Appendix

Variable Definitions		
Variables	Description	Source
Firm Performance		
TobinQ	Market Capitalization scaled by Total Assets, as given in Orbis.	Orbis
Transfer Pricing Risk		
TPRisk	TP_Risk = (OPM_Exp + PoD + FTaxForeign) x Pr (A) where: TP_Risk: transfer pricing risk coefficient; OPM_Exp: operating margin exposure to interest rates. It takes each firm absolute value of a coefficient from a regression of annual operating margin percentage on the monthly percentage change in 12 Months EURIBOR; PoD: difference between the parent probability of default and the average probability of default for the set of affiliated firms in foreign jurisdictions; FTaxForeign: average number of affiliated firms with statutory tax rate above its parent; Pr (A): probability of transfer pricing audit according to each country fiscal strength rule index (FSRI) profile;	Zhang (2009)
TPRisk High	1 if firm *f* shows transfer pricing risk above the industry 90th percentile, 0 otherwise;	
TPRisk Low	1 if firm *f* shows transfer pricing risk below the industry 10th percentile, 0 otherwise;	
Tax Avoidance		
ETR	Median for nine-year period of book effective tax rate, calculated as tax expense over profit before tax. Firms with tax refunds are set to zero, while firms with positive taxation, but negative pre-tax-income are set to one. See, please Gupta and Newberry (1997).	Orbis
NONTA	1 if firm *f* shows an effective tax rate above the industry 90th percentile, 0 otherwise.	
TA	1 if firm *f* shows a book effective tax rate below the industry 10th percentile, 0 otherwise;	

Country-Level Regulation		
CTRLCorruption	Median (2010-2018) estimation indicator about the perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests;	The World Bank
CTRLRegulatory	Median (2010-2018) estimation indicator about the perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development;	The World Bank
Rule of Law	Median (2010-2018) estimation indicator perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence;	The World Bank
TPAudit	1 if firm *f* is in a country whereas likelihood for transfer pricing audit is high, 0 otherwise.	Ernst Young
Penalty Exposure	1 if firm *f* is in a country with specific penalty provisions in regulation for failure in transfer pricing documentation, 0 otherwise.	Ernst Young
Control Variables		
SIZE	Logarithm of total assets;	Orbis
LEV	Ratio of long-term debt to total asset;	Orbis
R&D_INT	Ratio of intangibles to total assets;	Orbis
ROA	Ratio of pre-tax profits to total assets;	Orbis

Chapter 5

5 Conclusion

This thesis contribution is in the field of transfer pricing risk from three different perspectives. First, we examine how different forms of tax convexity are associated with transfer pricing risk. To this end, we developed an explicit transfer pricing risk model and regress this on three main sources of tax convexity induced by tax-law provisions. Our conclusions provide strong empirical evidence that multinationals facing tax convexity (*i.e.*, negative income correlation, loss carryforwards and tax asymmetry) have a significant effect on transfer pricing risk. These implications are relevant for mainstream and active policyholders (e.g., OECD and UN), since it introduces new evidence on how new transfer pricing policies can be approached and implemented to reduce firm's propensity to transfer pricing risk.

Second, we study how internal governance structures monitor transfer pricing risk profile of multinational firms. Empirical evidence indicates that internal governance monitorization through independent directors, audit/governance/risk committees, or institutional ownership reduces firms transfer pricing risk profile, and its impact on overall organization risk performance. Given the extent that transfer pricing regulation is mainly devoted to satisfying compliance assessments, our conclusions show that robust corporate governance structures allow for an effective monitorization of firms transfer pricing compliance and transparency as a whole.

Third, we focused in examining investors valuation about transfer pricing risk, and how external corporate governance and transfer pricing regulation, at country-level, impact investors assessment. Empirical inferences show that investors have a positive and significant valuation about high levels transfer pricing risk. On other hand, country-level corporate governance and transfer pricing ruling can sustain investors valuation about transfer pricing risk. This set of empirical evidence shows that transfer pricing risk is not limited by transfer pricing legislation, but also by countries corporate governance environment.

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