Transfer Pricing Risk and Corporate Governance: Evidence from OECD Countries

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Abstract:

Background*: In today's international business, transfer pricing risk is critical for governments and policyholders, which focus much of the debate around compliance on offshoring and tax avoidance. This study hypothesizes about the level of transfer pricing risk, ceteris paribus, as a consequence of firms robust or weak internal corporate governance.*

Materials and Methods*: Using a sample of 1466 parent firms, selected from 25 countries, we develop an effective measure of transfer pricing risk and examine how responsive it is to firms internal governance structures. We control our empirical inferences using risk management theory.*

Results/Conclusion: *and show that independent directors, audit/governance/risk committees, or institutional ownership reduce the transfer pricing risk profile in multinational firms. Alternative tests allow us to reinforce these results by using different methodologies and parameters estimation that specify transfer pricing risk at different levels.*

Key Word*: Transfer pricing; corporate governance; risk management theory.*

I. Introduction

International commerce has exposed transfer pricing to greater and controversial risks. This sometimes leads to disagreement between multinational firms and local tax authorities. This lack of consensus has heightened relevant developments in transfer pricing regulatory framework . Despite the improvements, regulation has been extremely focused in compliance requirements that rather satisfy local tax authorities transfer pricing risk assessments. We explore this gap by examining how firm's internal governance structures control for transfer pricing risk. We define transfer pricing risk, mainly, as the exposure of multinational firms profits to changes in interest rates. Also, we subject firms transfer pricing to identical risk management incentives (i.e., taxes, financial distress, and information asymmetry) based on pioneer literature of 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, considering internal governance monitorization, makes inferences about the effects of corporate governance on transfer pricing risk more realistic and reliable.

We perform an empirical analysis on previous assumptions in four stages. First, we compute a transfer pricing risk model to capture public-listed firms' exposure to changes in interest rates (i.e., 6M 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 differences between the parent and affiliate probability of default, and a second that takes the percentage of foreign affiliates resident in a jurisdiction 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. Our measure of transfer pricing risk indicates the flexibility with witch firms can manage transfer pricing strategies. Overall, we expect that firms with certain incentives will preserve a higher ability to benefit from transfer pricing strategies.

Second, we examine the effects of taxes (i.e., loss carryforward), bankruptcy (i.e., Altman Z-Score), asymmetric information and ownership (i.e., manager/director ownership) on transfer pricing risk. Empirical results show that for every firm constrained by limited carryforwards loss provisions, transfer pricing risk increases by 0.172. compared to firms with unlimited periods to report prior losses. Similarly, for every firm showing robust financial health, transfer pricing risk increases by 0.112. compared to firms in financial distress scenarios. Also, for every firm with high insider ownership, transfer pricing risk increases by 0.037. 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 the presence of independent directors as the most effective mechanism to control transfer pricing risk, with this decreasing about 0.143. Similar results were found to other internal governance mechanisms, with exception of advisory services rendered by mainstream accounting firms that cause an increase in transfer pricing risk of 0.106.

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

This paper makes relevant contributions given the scarce research involving transfer pricing and corporate governance. We show that transfer pricing is a channel through witch poor internal governance facilitates tax avoidance. Even tough, previous literature has documented the association between governance and tax avoidance, we are able to interlink these two concepts through transfer pricing risk. Therefore, our study not only develops an explicit measure of transfer pricing risk, but it also provides empirical evidence related to broad 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 common used measures of tax avoidance or aggressiveness (i.e., effective tax rate or book tax differences) and (ii) apply a strategy that allows inferences about the effects of internal corporate governance on transfer pricing risk to become accurate.

Last, 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 standard approach in most of transfer pricing frameworks. The paper is structured as follows: Section 2 provides an overview of prior literature relating transfer pricing and corporate governance and section 3formalizes the hypotheses. Section 4 describes the research design. Section 5 presents the results and formulates alternative tests. Finally, section 6 concludes.

II. Literature review

The association between transfer pricing and corporate governance has been studied, mostly, from a tax avoidance or tax aggressiveness perspective. Despite the context, it is part of the general literature on 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 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) suggested that independent directors in board structure may increase regulation and mechanisms that preserve shareholders' wealth. However, Fama and Jensen (1983) argued 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) found in public-listed Australian firms that greater audit committee independency is associated with less tax avoidance. Moreover, Hsu et al., (2018) suggested that audit committees and independent financial experts show less propensity for tax avoidance.

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

III. Theory and hypothesis development

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 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.

Taxes

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

H1. Limited tax carryfoward provisions are positively associated with transfer pricing risk.

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. Financial strength is positively associated with transfer pricing risk.

Information asymmetry and ownership

According to DeMarzo and Duffie, (1991) and Géczy et al., (1997), information available for institutional shareholders and board directors is asymmetric. For example, many decisions and risks adopted on 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.

Independent directors

Board independence has been extensively studied in the context of the preservation of multinational firms' value. 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 the same spirit, we assume that the presence of independent board directors reduces firms transfer pricing risk profile in a way that managerial decision-making becomes more prudent and ethical, with shareholders' interest being 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.

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 that the presence of any of these committees in multinational firms' board structures is 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.

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 mainly institutional. Thus, we formulate the following hypothesis:

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

Mainstream audit firm

Most often, transactions between affiliated firms are supported by skilled advisory audit teams. These take advantage 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.

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, as audit/risk/governance committees and institutional owners to have greater monitorization effect 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 loss carryforwards incentives.

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

IV. Research design

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, or BEPS actions 8-10. For an average initial sample of 74.295 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) and 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 are at the consolidated level.

Dependent variable

Transfer pricing risk: Our model adopts intra-group financial practices often used by multinational firms' in the scope of group financing policies, which usually allow underlying affiliates to benefit from better terms and conditions. The risk involving such financing policies is regulated by policyholders and governments throughout the arm's length principle that require 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 via three main parameters: (i) the exposure of firms profits to changes in interest rates (OPM Exp),(ii) the difference between parent and foreign affiliates probability of default (PoD), and (iii) whether foreign affiliates statutory tax rate is above its parent (TaxForeign Subs). For those parent firms located in countries with high strength rule index (FSRI) profile (Deroose et al., 2006) the probability Pr(A) of transfer pricing audit increases, with risk following. To illustrate how to arrive at the transfer pricing risk variable, we formulate the following equation:

$$TP\_Risk = (OPM\_Exp + PoD + TaxForeign\ Subs) \times Pd\ (A) \qquad (1)$$

OPM_Exp stands for each firm operating margin exposure to interest rates. This is computed for each firm as the absolute value of a coefficient from a regression of annual operating margin percentage on the monthly percentage change of 6 months 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 in PoD, affiliated firms in same country were excluded from our analysis; TaxForeign Subs is given as the average number of affiliated firms with statutory tax rate above its parent; Pd (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.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, or BEPS actions 8-10. For an average initial sample of 74.295 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) and 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 are at the consolidated level.

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 is 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 where 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 the board composition, or any firm committee or department, 0 otherwise; finally, firms with audit, risk, or governance committee (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.

Control variables: We control for other common factors often used in prior literature. To account for 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 for 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 on local tax authorities transfer pricing audit agenda given the easiness and properties of such assets to erode profits (Mutti and Grubert, 2008); 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, which allows us to significantly soften the impact of potential outliers without losing observations.

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:

$$TP\_Risk_{it} = \alpha_0 + \beta_1.LCF_i + \beta_2.ALT\_ZSCORE_{it} + \beta_3.ASYMINFO\_OWN_i + \beta_n.X_{it} + \varepsilon_{it} \qquad (2)$$

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:

$$TP\_Risk_{it} = \chi_0 + \chi_1 BoD\_IND_i + \chi_2 ARG\_COMT_i + \chi_3 INST\_OWN_i + \chi_4.BIG4_i + \chi^n.X_{it} + \varepsilon_i \qquad (3)$$

Internal governance explanatory variables are defined as shown previously, so does the set of control variables, X, and the error term, ε.

The third test explores how effective internal governance is in attenuating the effects of risk management incentive on transfer pricing risk as formulized in H8 and H9:

$$TP\_Risk_{it} = \lambda_0 + \lambda_1 LCF_i.BoD\_IND_i + \lambda_2 LCF_i*ARGE\_COMT_i + \lambda_3 LCF_i.INST\_OWN_i + \lambda_4 ALT\_ZSCORE_{it}.BoD\_IND_i + \lambda_5 ALT\_ZSCORE_{it}.ARGE\_COMT_i + \lambda_6 ALT\_ZSCORE_{it}.INST\_OWN_i + \lambda_n.X_{it} + \varepsilon_{it} \qquad (4)$$

V. Empirical results

Descriptive statistics

Table 1 - Panel A, indicates that for the average firm in the sample, transfer pricing risk (TP_Risk) is 0.242. In Panel B, variables on risk management incentives show that about 26% of sample firms have limited forward

periods to report their losses (LCF), where around 27% have 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 countries 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 the sample, while the remaining account for 60 percent. Allowing for such a balanced sample structure, regression estimates increase in reliability and robustness.

Table no 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
BIG10	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

Multivariate results

Table 2 presents the regression results for the effects of risk management incentives on transfer pricing risk. Column (1) suggests that firms with limited carryforward loss provisions show higher (0.172) transfer pricing risk compared to those with unlimited tax periods to report prior losses. To this end, H1 is supported: limited tax carryfoward provisions are positively associated with transfer pricing risk. Column (2) shows firms with higher financial health to show greater transfer pricing risk (0.112), given their ability to afford potential bankruptcy costs from affiliated firms. This supports H2: financial strength is positively associated with transfer pricing risk. Column (3) shows that firms mainly owned by managers/directors show greater transfer pricing risk profile (0.037). 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 ASYMINFOOWN that even though its coefficient remain a positive, it loses significance.

Table no 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 2, columns (1) to (3) report the regression coefficients for loss carryforwards, 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 parentheses.
Variables definition are presented in detail in appendix.

Table 3 presents the effects of internal corporate governance on transfer pricing risk. Column (1) shows that firms with independent directors in their board structure report less transfer pricing risk (0.143). Thus, H4 is supported: the presence of independent directors on the board is negatively associated with transfer pricing risk. Column (2) suggests that audit, risk, or governance committees also reduce firms transfer pricing risk (0.042). 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 firms majorly institutionally owned report less transfer pricing risk (0.048), which is in 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 firms advised by BIG4 firms show higher transfer pricing risk (0.106). Thus, H7 is supported: employment of mainstream audit firms is positively associated with transfer pricing risk.

Table no 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, 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 parentheses.
Variables definition are presented in detail in appendix.

Table 4. columns (1) to (3) show how independent directors, audit/risk/governance committees, and institutional ownership attenuate multinational firms transfer pricing risk profile before loss carryforward incentives. Coefficient estimates for LCF*BoD_IND generate the higher and statistically significant reduction effect on transfer pricing risk (0.093) ; for LCF*ARG_COMT results are similar, but with little effects on transfer pricing risk (-0.006) 6; LCF*INST_OWN shows weak monitorization effects, being statistically not significant. We found reasonable to conclude that only the presence of independent directors or

audit/risk/governance committee, substantially, decrease firms transfer pricing risk towards loss carryforward incentives. 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) ; for ALT_ZSCORE*ARGE_COMT and ALT_ZSCORE*INST_OWN coefficients also show 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.

Table no 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 R2	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 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 parentheses.
Variables definition are presented in detail in appendix.

Alternative results

We reinforce the significance of previous results by developing two additional tests. First, we hypothesize about the possibility of the transfer pricing risk model to be biased 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.(4) as dependent variable to regress these on internal governance exploratory variables.

Table 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 no 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 5, column (1) shows the coefficients results from an *OLS* regression using the residuals from eq. (4) as dependent variable. Column (2) replicates the procedure of column (1), where explanatory variables are measured as continuous variables, instead of dummy variables. For robustness, control variables include also risk management incentives variables, 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 parentheses.

Secondly, we examine firm's probability of making a change from low/medium, to high transfer pricing risk profile   given its internal corporate governance characteristics. We rely on 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 6. column (1), coefficients suggest that, firms with BoD_IND (0), comparatively to BoD_IND (1), the multinomial log-odds 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 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 not offer enough reliable statistical significance. 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 (G2(20) = 298.248; p = 0.000).

Table no 6: Alternative analysis – multinomial regression.

	Dependent variable: TP_Risk Ordinal			
	(1) – Low Risk		(2) – Medium Risk	
Variables	Coefficient Estimates (β_j)	Odds Ratio ($Exp\ \beta$)	Coefficient Estimates (β_j)	Odds Ratio ($Exp\ \beta$)
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]		
Nagelkerke R^2		0.207		
N		13 194		

Table 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, 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 parentheses.

VI. 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 is influenced by unexpected factors, and also (ii) governance effects changes across different transfer pricing risk profiles, using a multinomial regression approach. First, we show that, despite the unknown factors impacting transfer 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 a lower probability to presenting low transfer pricing risk, as opposed to high transfer pricing risk.

Our 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 better monitorization and allow the increase of 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.

Our paper takes preliminary steps for new academic and professional research. This could include, first, studying the particularities of corporate governance regulation, at country level, and how these interacts with transfer pricing would help 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 in 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).

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Appendix

Variable Definitions		
Variables	Description	Source
Transfer Pricing Risk		
TP_Risk	TP_Risk = (OPM_Exp + PoD + TaxForeign Subs) x Pd (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 6 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; *TaxForeign Subs*: 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;	
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