Norwegian School of Economics
Bergen, Fall, 2020

The Role of Development on Multinationals' Incentive to Shift Profits

An Empirical Study on Global Multinational Enterprises

Ole Tøger Tøssebro & Jonas Strøm Tjernshaugen

Supervisor: Mohammed Mardan

Master thesis, Economics and Business Administration

Major: Financial Economics

NORWEGIAN SCHOOL OF ECONOMICS

Acknowledgements

This thesis is written as a concluding part of the Master of Science in Economics and Business Administration, within our Major in Finance, at the Norwegian School of Economics. Throughout the project, the focus has been on learning and acquiring a better understanding of profit shifting incentives of multinationals. The work has been challenging at times, yet highly educational and rewarding.

We would like to thank our supervisor, Mohammed Mardan, for introducing us to the field of research. His genuine interest and insights have been invaluable, and we appreciate the exemptional guidance and discussions throughout the processes. Further, we would like to thank the Norwegian Center of Taxation (NoCeT) and the Norwegian Tax Authorities for acknowledging this thesis and awarding us with a grant.

Norwegian School of Economics

Bergen, December 2020

Ole Tøger Tøssebro

Jonas Strøm Tjernshaugen

Abstract

Despite substantial empirical evidence of tax induced profit shifting in advanced economies, the evidence from developing economies is poor. For the few studies examining the role of development, the conventional approach has been to separate the responsiveness to the tax incentive by two pre-defined cut-offs, which assumes a linear relationship. This thesis investigates whether there is a non-linear relationship between tax sensitivity and development. Utilizing the conventional approach on a panel data of 463,125 affiliate-year observations in 175 countries, we show that there indeed is a negative relationship between tax sensitivity and development. Our findings further indicate that the relationship might be more nuanced, as affiliates operating in the lower-middle of development face the highest tax sensitivity, while affiliates in the least developed countries face a lower tax sensitivity than the latter. In addition, the upper-middle in our sample is expected to respond to the tax incentive in the opposite direction, which is counterintuitive and has not been observed in existing literature. Since the long-lasting suspicion, that lack of capacity in the tax administration limit the ability to curb profit shifting, might not solely explain our findings, this study provides alternative explanations related to country-specific risk. Specifically, our empirical results suggest that political uncertainty, corruption in the tax administration and compliance costs can possibly explain the non-linearities observed.

Contents

Tables and Figures

Tables

Figures

1. Introduction

In recent years, tax planning by multinational enterprises (MNEs) has risen to prominence in public debates and received extensive attention from the media, often due to low effective tax rates by the well-known technology firms.[1] The international tax rules, designed more than a century ago, has experienced a substantial strain as globalization has soared in recent years (OECD, 2020). Shortcomings in the existing rules have created opportunities for MNEs to shift profits from higher taxed affiliates to lower taxed affiliates, thus eroding governments' tax bases around the world. The issues caused by the digital economy has led to the Base Erosion and Profit Shifting (BEPS) Project, by G20 and Organization for Economic Co-operation and Development (OECD). The project was carried out to ensure taxes is paid where the value is created, by addressing detailed measures to curb BEPS (OECD, 2015a). However, concerns have been raised of the neglection of less developed countries.[2] As addressed by Oguttu (2016), implementation of international tax reforms needs to include all countries, in order to prevent exacerbation of global inequality.

While there has been provided substantial empirical evidence of tax induced profit shifting in advanced economies, the evidence from developing economies is limited. Less developed countries set on average lower corporate income tax rates, but conflictedly are also more depended on their tax base due to fewer alternative sources of income (Crivelli, De Mooij and Keen, 2016). In addition, MNEs operating in developing countries are typically registered with the tax authorities, while smaller domestic corporation usually operate in the shadow economy (Fuest, Hebous and Riedel, 2013), leaving these countries particular exposed to the source of income by taxing MNEs. From a policy perspective, the vulnerability of less developed countries puts a constrain on raising tax revenues, which ultimately curtails the capability to provide public serves, reduce poverty and cripple economic prosperity.

Johannesen, Tørsløv and Wier (2019) concludes that there is a negative relationship between development and tax avoidance, but the underlying mechanisms leaving developing countries more exposed to profit shifting, are less clear and thus of importance for future research. The

---

[1] For instance, Tax Watch UK estimated that the Google, Microsoft, Facebook, Apple and Cisco through 2012-2017 collectively made £30bn in profits from customers located in UK but only paid £933m (i.e., 3%).

[2] Although inclusion of developing countries is increasing (OECD, 2015b).

accepted explanation in the literature has been that the lack of resources and capacity in the tax administration to implement and enforce effective anti-avoidance rules, reduces the concealment costs and thus spur tax avoidance. For the few studies examining the role of development, the common strategy has been to either run separate regressions or include a dummy variable to separate the responsiveness to the tax incentive. Common for both approaches is that they utilize a pre-defined cut-off which assumes a linear relationship between tax sensitivity and development. Since the research on the subject is limited, the aim of this thesis is expressed in the following:

Given the literature assumes a linear relationship between tax sensitivity and development, we investigate whether this relationship actually is non-linear

To examine this, we apply firm-level accounting data retrieved from Orbis database, provided by Bureau van Dijk. Our methodology builds on the novel work by Hines and Rice (1994) and later Huizinga and Laeven (2008), where we seek to estimate the true profits of an affiliate based on a production function. To measure the responsiveness to the tax incentive, we appraise the composite C-measure developed by Huizinga and Laeven (2008), which jointly accounts for tax rates faced by all related affiliates of the MNE, as well as opportunities of shifting as a function of economic activity. The first part of this thesis investigates the tax sensitivity and whether the relationship between tax sensitivity and development is non-linear. That is, we examine the tax sensitivity of MNEs by utilizing ordinary least square (OLS) regressions for the year 2015 to directly compare our results to Huizinga and Laeven (2008).[3] Further, we investigate the role of development by expanding the OLS on an unbalanced panel for 2011-2019 while controlling for a set of fixed effects.

Previous studies on profit shifting applying similar approach in a panel estimation on European MNEs, finds a semi-elasticity in the range of -0.4 to -0.8. Carrying out a regression on 463,125 global affiliate-year observations, we find a statistically significant semi-elasticity of earnings before interest and taxes (EBIT) with respect to the C-measure, of -0.58. Meaning, a 10-percentage point decrease in the C-measure are associated with an increase in reported earnings of 5.8% on average. Moreover, appraising the conventional approach, we find that

[3] In addition, carrying out a full replication of the main model and robustness specifications of Huizinga and Laeven (2008), we are able to conclude that our results are valid according to their methodology and thus enhances the confidence in our sample procedure.

affiliates in the upper 75th percentile of our sample would on average respond to a change in the tax incentive of 88% *lower* than affiliates below this threshold. However, our findings indicate that the relationship might be more nuanced. Affiliates in the least developed countries face a lower tax sensitivity relative to affiliates in the lower-middle of development which faces the highest tax sensitivity. In addition, we find a positive semi-elasticity for the upper-middle of the development in our sample, which is counterintuitive. These findings have not been addressed, nor found in the existing literature. The long-lasting suspicion that lack of capacity in the tax administration might not solely explain our results.

Therefore, the second part of this thesis, investigates potential alternative explanations for the non-linearities observed. Specifically, we investigate the role political uncertainty, corruption in the tax administration and underdevelopment or complexity of the tax system. Firstly, we argue that uncertainty caused by political turmoil reduces the predictability of future profits, which is expected ex ante to reduce the tax sensitivity as the risk of jeopardizing the overall minimization strategy of the global tax bill increases. Secondly, the presence of corrupt tax officials allows to circumvent existing regulations which, in turn, increases the tax sensitivity if bribes are an option. However, in the most corrupt environments, non-tax related bribes may emerge, which could potentially reduce the tax sensitivity. Thirdly, the regulatory burden imposed on MNEs by the tax administration increases compliance costs which should decrease the tax sensitivity if the costs exceed the benefits.

Our findings suggest that the regulatory burden is most prevailing in the least developed countries, which imply higher compliance costs and could therefore potentially explain the relatively lower tax sensitivity of the least developed countries. Additionally, it could be driven by non-tax related bribes as the least developed countries have on average the highest corruption level. Lastly, these countries are also exposed to more political turmoil relative to the lower-middle, which may also contribute to reducing the tax sensitivity.

Further, we find that affiliates in countries with moderate to high levels of corruption face the largest tax sensitivity, which reconciles with an average development level at the lower-middle. According to our prediction, that corruption facilitate profit shifting, this could possibly explain the highest tax sensitivity. Interestingly, we also find that these affiliates are exposed lower political uncertainty which may facilitate more abusive transfer prices, and therefore potentially explain the higher tax sensitivity.

Lastly, the counterintuitive result for the upper-middle of development can possibly be caused by political uncertainty. For these affiliates, the *average* uncertainty is the highest in our sample, which in turn, may imply the optimal strategy of the MNE is not to set abusive outward or inward transfer prices as the risk of jeopardizing the minimization of the global tax bill is too severe. Our results therefore suggest the risk motive may dominate the tax motive.

To investigate the robustness of our findings, several tests were performed. Utilizing alternative proxies of the tax incentive, we continue to find consistently negative and significant effects. Considering possible skewness by sample selection, we do indeed find that high-income countries face a lower tax sensitivity than lower-income countries, as well as similar pattern for the non-linearities. Our development specifications are also robust to alternative proxies. Proceeding by evaluating whether our results related to the risk measures are sensitive to sample restrictions, we find that the direction of our predictions remain qualitatively similar. Moreover, since our predictions are quite narrow, we tried to isolate the different effects by applying alternative proxies where suitable. The predicted direction of our explanations remained to a large degree consistent.

Our study provides several contributions to the profit shifting literature. We provide updated estimates of profit shifting on both European MNEs as well as global MNEs. Further, we challenge the conventional approach applied in the existing literature of a linear relationship between development and tax avoidance. Moreover, we have attempted to answer the call of Johannesen et al. (2019) by analysing different opposing effects considering country-specific risk which may create a non-linear relationship. As opposed to the standard argument of the lack of capacity in the tax authorities, we propose that the compliance costs and corruption in the tax administration may be important considerations for MNEs’ tax planning decisions. In addition, political volatility serves a potential explanation for all points evaluated on the non-linear curve, implying this may also be an important consideration for MNEs.

From a policy perspective, our findings confirm the vulnerability of less developed countries. Higher tax sensitivity implies that any attempt to increase the tax rate, generate small increases in government income. Hence, inability to curb profit shifting in less developed countries put a strain on tax policy. Our findings could potentially raise the question if the compliance costs or complex tax systems are strategically set to increase the effect on states revenues by taxation, as we have observed for the very least developed countries relative to the lower-middle. Further, reducing corruption in the tax authorities may be important to reinforce the effect of tax rate increases, thus fighting corruption cohere with increasing government revenue.

The remainder of this thesis will be structured as follows: Section 2 provides a review of related literature. Section 3 presents the theoretical framework and the empirical strategy. Section 4 describes the data. Section 5 presents the empirical results. Section 6 provides an explanation for our findings. Section 7 tests the robustness of the results, while Section 8 concludes.

2. Related Literature

A common strategy in the profit shifting literature has been to interpret the tax sensitivity of profits as indirect evidence of profit shifting. That is, the responsiveness to a given tax incentive, where a higher sensitivity of profits is inferred as aggressive profit shifting activity conducted by the MNE. Examining this, the model developed by Hines and Rice (1994) have been dominant approach in the literature on profit shifting (Dharmapala, 2014). Using country-level aggregated data on American multinationals from U.S. Commerce Department for the year 1982, Hines and Rice (1994) regresses the variable of reported profitability on tax rates and the Cobb-Douglas production function. Using OLS, they report a semi-elasticity of 2.25. However, more recent studies applying cross-sectional data have obtained smaller estimates. The novel study of Huizinga and Laeven (2008) uses firm-level cross-sectional data from Amadeus database provided by Bureau van Dijk, on European multinationals. Their results suggest a semi-elasticity of reported profits, EBIT, with respect to the statutory tax rate of 1.3. Meaning, increasing the tax incentive to shift profits to affiliate *i* by 10-percentage points, is associated with an increase in the reported earnings by affiliate *i* by 13-percentage points.

Common for profit shifting studies prior to 2010, is that they usually do not utilize panel or longitudinal data. However, more recent studies have been able to capitalize on the increased data availability of firm-level data across years. Dharmapala (2014) argues that the panel data approaches, which controls for observable and unobservable determinants of reported profits, has provided more credible estimates of the magnitude of profit shifting. For instance, while controlling for unobservable fixed effects, Dischinger (2010) finds a lower semi-elasticity of 0.7 on a panel data consisting of European MNEs for the period 1995-2005 provided by Amadeus database. Using the same database, Lohse and Riedel (2013) updates the data with a panel of European MNEs from 1999-2009 and finds a semi-elasticity 0.4. By utilizing a quantitative approach based on a meta-regression analysis, Heckemeyer and Oversech (2017) evaluate 27 different empirical profit shifting studies. They find a semi-elasticity of 0.8, which is closer to Dischinger (2010) than older studies. Importantly, due to the variation in previous estimates, they did find a consensus estimate of the scale of profit shifting. Moreover, the study compares the use of aggregated data versus firm level data. Their conclusion is that the aggregated data seems to have an overestimated influence on the return of profit due to different tax rates.

While the coverage in the literature has been predominantly centred around advanced economies, a growing number of studies on the role of development with respect to tax avoidance, are emerging. An important explanation for lack of coverage, is the data availability of firm-level data required for the consensus of the empirical strategies used for developed economies. It is well established that developing countries on average sets a lower corporate tax rate, and interestingly, at the same time are more dependent on their tax base as opposed to developed countries due to fewer alternative sources of income (Crivelli et al., 2016). In fact, Fuest et al. (2013) showed that developing countries usually have a tax-to-GDP ratio of 15 percent, while developed economies usually have a tax-to-GDP ratio above 30 percent. By analysing 210,000 corporation in 142 countries, Johannesen et al. (2019) finds that the level of development is negatively related to tax sensitivity of profits. Specifically, a 10-percentage point decrease in parent tax rate increases the probability to report zero profits in low- and middle-income economies by 3.6 percentage points. By contrast, the same effect for subsidiaries in high-income economies only yielded 1.6 percentage points. Hence, this confirms the vulnerability of developing countries and Johannesen et al. (2019) argue this may explain why less developed economies hesitate to increase tax rates and tighten their anti-avoidance policies. Similarly, Crivelli et al. (2016) showed that the sum of real investment and profit shifting response to the tax incentive are more pronounced in less developed countries. Focusing on debt shifting, Fuest et al. (2011; 2013) find that the effect of taxes on intra-company loans in developing countries are twice the size that in developed countries.

While there has been provided some empirical evidence of negative relationship between development and tax avoidance, it is less clear what causal mechanisms are at play (Johannesen et al., 2019). A common interpretation is the limited ability to curb profit shifting activity. For example, lack of capacity or willingness to obtain required information on taxpayers, such as transfer pricing documentation or implementation of effective anti-avoidance regulations. While many developing countries already have anti-avoidance rules, as thin-capitalization rules (TCR) and controlled foreign corporation (CFC) rules, in place, they tend to set these laxer compared to developed countries (e.g., Fuest et al., 2013; Mardan, 2017). Intuitively, weaker profit shifting regulations implies a lower concealment costs for MNEs, and thus increases the shifting incentive. That is, weaker tax regulations implies that profit shifting conducted by the MNE require, for instance, less documentation and legal advice, in order to defend their avoidance practices. This holds whether the rules are aimed at curbing debt shifting or transfer pricing, or both. Mardan (2017) shows that governments, despite increased shifting incentives, in less financially developed countries set a more generous TCR to compensate for more constrained external financing options, on average. Others have shown that less developed countries may need to set a weaker TCR in order to attract foreign direct investment (FDI), even if welfare could decrease (e.g., Gresik, Schindler and Scheldrup, 2015). The incentive caused by lower cost of profit shifting seem to coincide with the previous literature who finds a more pronounced effect of shifting activities in developing countries.

Since most of the attention in the profit shifting literature has been centred around advanced economies, and relatively few examining the role of development, it is important to acquire a broader understanding of how MNEs conduct their tax planning activities. From a profit shifting perspective, the ability to free up cash through strategic allocation of capital in order to optimize the after-tax global profits, clearly serves as an important advantage compared to domestic corporations. In a globalized setting, it is important to acknowledge that the development of a country is usually closely connected to the overall country-specific risk, which could potentially distort a simple linear relationship between tax sensitivity and development.[4] Despite some evidence of negative relationship between development and tax sensitivity, less is known how MNEs incorporates country risk and costs associated with tax planning (Dhawan, Ma and Kim, 2020). Within the scope of existing literature, the focal point has usually either been the effect of tax on profits or the effect of risk on firms' profits. A better understanding of the interplay between both is therefore needed.

Johannesen et al. (2019) found that increasing the quality of the governance reduces the effect of a change in the parent tax rate or foreign tax rates on the propensity to report zero profits. That is, lower institutional quality increases the tax sensitivity. However, less institutionally developed countries may also impose inefficiencies and regulatory burdens on firms. That is, governments enforcing tax laws, vary in enforceability and complexity. For instance, Belitski, Chowdhury and Desai (2016) argue that complexity or underdeveloped regulations could trigger unreliable or inconsistent contract enforcements and compliance and negotiation costs. By studying newly establishments on a panel of 72 countries from 2005-2011, they did not

[4] Country-specific risk is a widely defined concept covering many important factors which MNEs have to incorporate in their tax planning strategies. While there is hardly any universal definition of country risk, it can be generalized to any risk within a specific country that may impose losses on an MNE such as social risk, institutional risk, economic and financial risk among others. In this thesis, we will only consider institutional risk on the assumption that this may be more directly related to tax decisions of MNEs.

find a significant relationship between complex tax systems proxied by the number of tax payments and time to pay taxes. Nevertheless, they further argue that underdevelopment of the government could possibly lead to market failure and incentivize firms to circumvent the regulations. For instance, Dreher and Gassebner (2013) find that corruption may facilitate firm entry when economies are highly regulated.

Historically, the views on the consequences of corruption have been rather divided with especial emphasis on the "grease the wheels" theory. One of the earlier papers examining this effect was Leff (1964). He showed that corruption could lead to positive economic development, as well as a hedge against losses due to bad economic policies. Furthermore, Lui (1985) analysed the effect of bribes with respect to the effectiveness of public queue systems. Interestingly, the result suggested that accepting bribes could speed up the process and thus more project would be initiated. A more recent study by Svensson (2005) report no significant or even a positive relation between bribe payments and profits of firms operating in Uganda. However, other researchers find the opposite relationship. For instance, Shleifer and Vishny (1993) find a negative relationship between economic growth and corruption. By utilizing the same data as Svennsson (2005), Fisman and Svennsson (2007) find that the negative effect of taxes on profitability is only one third of the negative effect of corruption on profits. By analysing interaction between efficiency and corruption, Meon and Weill (2010) finds evidence for both weak and strong form of the "grease the wheels" theory. That is, corruption is less damaging to efficiency where institutions are less effective, and in countries with extremely inefficient institutions, the effect may even be positive. Moreover, Belitski et al. (2016) finds that in certain environments, the negative effect of tax policies on firms' entry, may actually be offset by corruption. Comparing the latter with the conflicting findings of Fisman and Svennsson (2007), it becomes evident that corruption itself might be more nuanced.

One of the few studies examining the relationship between profits shifting and corruption, is Bilicka and Seidel (2020). Applying firm-level data for approximately 190,000 European firms from 2005-2013, they find that corruption enhances profit shifting. That is, higher corruption tends to increase the effect of tax rate differentials on reported profits. Specifically, they proxy corruption in the tax administration by utilize the control of corruption index provided by the World Bank and find an enhancing conditional effect of corruption on the tax incentive. They illustrate this by highlighting that if Norway and Italy simultaneously wore to increase the tax rate by 1%, the tax revenues would be expected to increase respectively by

0.86 and 0.79. Hence, if Italy reduced the corruption level to Norway´s level, Italy could gain an extra 7% in tax revenues, holding everything else equal.

While tax considerations and corruption are important determinants for any MNE in general, the uncertainty around corruption itself, may induce higher costs ex post than an equivalent sized tax (Svensson, 2003). Hence, the predictability of corruption serves as an important determinant of investment decisions. That is, high political certainty may increase the incentive to invest in a country. Analogously, political uncertainty may increase the incentive to divest. Malesky and Samphantharak (2008) confirmed the aforementioned incentives by utilizing a unique dataset of 500 corporations in Cambodia. Specifically, they found that a change in governor that decreased the corruption level, actually was offset by increased uncertainty surrounding corruption. This ultimately led to significantly less investment in the following period. Similarly, Julio and Yook (2016) examines FDI flows from US firms to foreign subsidiaries before and after election as a proxy for political uncertainty. They find that FDI drops before election and increases after the revelation of uncertainty. Hence, these studies suggests that uncertainty may be a more important determinant than the political risk itself.

Kesternich and Schnitzer (2010) evaluates the ownership share and optimal capital structure of MNEs that are exposed to different political risks. They find that ownership shares of foreign subsidiaries are negatively related to political risk, while leverage may both increase or decrease conditional on type of risk. Expropriation tends to reduce leverage since it makes it more likely of not meeting the interest payments due to higher interest rate as a compensation for higher risk. Similarly, creeping expropriation may reduce the overall income, thus increase the likelihood of default. Desai, Foley and Hines (2004) also find that increased political risk is associated with higher interest rates, but conflictedly also higher leverage overall. Lastly, Kesternich and Schnitzer (2010) did not find support for less leverage as the risk of confiscatory taxation increased, instead they found that the risk increased debt to avoid drain on profits. To the best of our knowledge, no comprehensive studies have thus far examined the role of political risk on profit shifting incentives.

3. Methodology

3.1 Theoretical Background

In order to carry out an analysis that empirically evaluate our research statement, it is essential to provide the theoretical background for our investigation approach. Our strategy builds on the model designed by Hines and Rice (1994) and later Huizinga and Laeven (2008), where we seek to estimate the true profits of an affiliate based on the Cobb-Douglas production function as a measure of activity.

Consider an MNE that operates in *n* countries with a parent firm located in country *p*. Since the MNE are exposed to tax rate differential between its operations, it has an incentive to manipulate the price on intra-group transactions to shift profits, measured as S_i. Thus, the true profits of affiliate *i*, B_i, is not directly observable. Since profit shifting, to an extent, is restricted, the MNE need to demonstrate that their transfer prices are in line with the arm's-length principal (ALP).[5] Hence, assuming a cost related to shifting profits is unavoidable. Huizinga and Laeven (2008) assumes that the costs rise in proportion S_i / B_i with a proportionality factor of γ, which is in accordance with Hines and Rice (1994). Hence, the total costs for the MNE in country, i, can be expressed as follows: $E_i = \frac{\gamma (S_i)^2}{2\,B_i}$. We follow Huizinga and Laeven (2008) and assumes E_i is tax deductible. The MNE would then maximize after-tax-profits of its worldwide operations given by:

$$L = \sum_{i=1}^{n}(1-\tau_i)\left(B_i + S_i - \frac{\gamma\,(S_i)^2}{2\,B_i}\right) - \lambda\sum_{i=1}^{n} S_i \qquad \textit{Eq. (1)}$$

Where τ_i is the tax rate, λ is the Lagrange multiplier and the total profits shifted by the MNE into all its operations in different countries, are non-positive; $\sum_{i=1}^{n} S_i \leq 0$. We can thus derive the value of additional profits in country *i* after tax and after marginal cost of shifting, by taking the first order derivative of Eq. (1) with respect to S_i, which yields:

[5] The use of ALP is the most common approach to tackle the transfer pricing channel. The fundamental principle of the rule states that an intra-group transaction is at arm's-length if the price of a comparable transaction would have been accepted by an independent enterprise.

$$(1-\tau_i)\left(1-\gamma\frac{S_i}{B_i}\right)-\lambda=0\ for\ all\ i=1,\ldots,n. \qquad \textit{Eq. (2)}$$

Eq. (2) simply states that that for all the affiliates within the MNE, the marginal value of reported profits should be equalized across all countries.

Further, it is important to recognize how the profit shifting incentive is dependent on the tax rates in all countries where the MNE is present. While Huizinga and Laeven (2008) only examined European MNEs and their European subsidiaries, the intuition holds for MNEs operating all part of the world as well. We can thus solve Eq. (2) with respect to the optimal profit shifting S_i into country *i*, which equates to:

$$S_i=\left(\frac{B_i}{\gamma(1-\tau_i)}\right)\frac{\sum_{k\neq i}^{n}\left(\frac{B_k}{(1-\tau_k)}\right)(\tau_k-\tau_i)}{\sum_{k=1}^{n}\left(\frac{B_k}{(1-\tau_k)}\right)} \qquad \textit{Eq. (3)}$$

Illustrated by Eq. (3), shifted profits, S_i, into country *i*, is a product of the true profits, B_i, scaled by $\gamma(1-\tau_i)$ and the effective tax rate differential $(\tau_k-\tau_i)$ weighted against $\frac{\frac{B_k}{(1-\tau_k)}}{\sum_{k=1}^{n}\left(\frac{B_i}{(1-\tau_k)}\right)}$. For example, when B_k decreases in country *k*, this implies a smaller weight of the MNE's operation in this country, which will lower the weights of the tax rate differential between country *k* and *i*. Hence, this will lead to a higher cost of shifting profits out or into this country, all else equal. The equation also assumes that the tax-deductible cost of profit shifting is deducted in the country where they are incurred.[6] Intuitively, optimal profit shifted into country *i*, S_i, is positively correlated with the tax differential between country *k* and *i*, $\tau_k-\tau_i$. Extending the reasoning, the sum of shifted profits, S_i, and reported profits B_i^r is equal to sum of true profits B_i, we can thus rearrange, and express reported profits by:

$$B_i^r=B_i\left[1-\left(\frac{1}{\gamma(1-\tau_i)}\right)\frac{\sum_{k\neq i}^{n}\left(\frac{B_k}{(1-\tau_k)}\right)(\tau_i-\tau_k)}{\sum_{k=1}^{n}\left(\frac{B_k}{(1-\tau_k)}\right)}\right] \qquad \textit{Eq. (4)}$$

[6] Huizinga and Laeven (2008) find a qualitatively similar result in an alternative specification assuming the costs are not tax deductible.

Taking the logs of the right-hand side and left-hand side, yields:

$$b_i^r = b_i - \frac{1}{\gamma} C_i \qquad \textit{Eq. (5)}$$

Where $b_i^r = \log(B_i^r)$, $b_i = \log(B_i)$ and C represents the tax incentive, that amounts to:

$$C_i = \frac{1}{(1-\tau_i)} \frac{\sum_{k \neq i}^{n} \left(\frac{B_k}{(1-\tau_k)}\right)(\tau_i - \tau_k)}{\sum_{k=1}^{n} \left(\frac{B_k}{(1-\tau_k)}\right)} \qquad \textit{Eq. (6)}$$

The cleverness of this C-measure is that it incorporates the international structure and tax rates faced by an MNE. In other words, it consists of a subsidiary's cost of shifting, tax rate and the weighted difference between this specific subsidiary's tax rate and the tax rates faced by all other related subsidiaries of an MNE. It is important to acknowledge that a negative *C* value is inferring as, in optimum, the MNE will shift profits into country *i*.

Considering that we cannot directly observe the true profits, B_i, we will assume that profits are a result of economic activity measured by the Cobb-Douglas function. The assumption coincides with the approach of Hines and Rice (1994) and Huizinga and Laeven (2008), and the function is given by $Q_i = cA_i^{\varepsilon} L_i^{\alpha} K_i^{\varphi} e^{u_i}$. The productivity measure, A_i, represent cross-country differences, u_i is a random term and the true profits are equivalent to the output, Q_i, less the wage bill, $B_i = Q_i - w_i L_i$. While assuming w_i is equal to the marginal product of labour, $c\alpha A_i^{\varepsilon} L_i^{1-\alpha} K_i^{\varphi} e^{u_i}$, the profits B_i can be written as $c(1-\alpha) A_i^{\varepsilon} L_i^{\alpha} K_i^{\varphi} e^{u_i}$. Log transformation of this equation yields:

$$b_i = \log(c) + \log(1-\alpha) + \varepsilon a_i + \alpha l_i + \varphi k_i + u_i \qquad \textit{Eq. (7)}$$

Where respectively a_i , l_i and k_i equals $\log(A_i)$, $\log(L_i)$ and $\log(K_i)$. Finally, the estimated true profits b_i, from Eq. (7), is substituted into Eq. (5) to generate the following estimation equation:

$$\log(\pi_i) = b_i^r = \beta_1 + \beta_2 a_i + \beta_3 l_i + \beta_4 k_i - \hat{\gamma} C_i + u_i \qquad \textit{Eq. (8)}$$

In *Eq. (8)*, $\beta_1 = \log(c) + \log(1-\alpha), \beta_2 = \varepsilon,\ \beta_3 = \alpha,\ \beta_4 = \varphi, \hat{\gamma} = \frac{1}{\gamma}$. Importantly, the C-measure enters the equation with a negative sign, suggesting a negative relationship with the log of profits. Given the log transformation, $\hat{\gamma}$ can be interpreted as the semi-elasticity of reported profits B_i^r with respect to C_i: $-\frac{1}{B_i^r}\frac{dB_i^r}{dC_i} = \hat{\gamma}$. Since tax authorities can determine the tax rate in the respective country, they implicitly affect the composite tax variable, C_i, and thus reported profits, B_i^r. Although Huizinga and Laeven (2008) also derived the elasticity of B_i^r with respect to the tax rate in country i, τ_i, as $-\frac{1}{B_i^r}\frac{dB_i^r}{d\tau_i} = \hat{\gamma}\ \frac{dC_i}{d\tau_i} > 0$ and for changes in tax rates in country, *k:* $-\frac{1}{B_i^r}\frac{dB_i^r}{d\tau_i} = \hat{\gamma}\ \frac{dC_i}{d\tau_k} < 0$, this will remain outside the scope of this thesis.

3.2 Investigation Strategy

As described by Dischinger (2010), a limited number of empirical studies have managed to study profit shifting by MNEs directly. That is, utilizing intra-company data on transfer prices and directly examining the deviations from the ALP. The common approach has thus been to indirectly measure profit shifting through the responsiveness to the tax incentive. Since data on intra-company transfer prices are hardly possible to obtain, we will, in accordance with most literature, rely on the indirect approach. While the majority of empirical studies have focused on developed countries, our dataset allows us to evaluate profit shifting in a global setting. That is, we are able to include a more representative tax rate differential by studying all countries the MNEs is active in, as well as a rich cross-sectional variation in development and other country-specific factors which could potentially distort the linear relationship. We approach our research statement by first estimating a cross-sectional model for the year 2015 to directly compare our results to Huizinga and Laeven (2008). Secondly, we expand the model to a panel estimation for 2011-2019 to examine to role of development on the tax incentive.

3.2.1 Cross-Sectional Analysis

The novel study of Huizinga and Laeven (2008) has been important for the profit shifting literature and recent research usually expands the fundamentals to panel (or longitudinal) estimations. However, few studies have replicated the findings in a cross-sectional estimation with newer data. It is therefore interesting to see if profit shifting has changed in this time span, based on their model. In addition, given the transparency with respect to the sample procedure of Huizinga and Laeven (2008), we find it crucial in terms of validity to evaluate that our estimates are in line with their study. Hence, we start the cross-sectional analysis by estimating a benchmark model for the tax sensitivity with respect to earnings for the year 2015 on European manufacturing firms with parents located in Europe. That is, a pure replication of the model of Huizinga and Laeven (2008) on only European MNEs for the year 1999.

The benchmark model will therefore be the estimated *Eq. (8)*, where we utilize the basic OLS and regress profitability on essentially four explanatory variables. Common for all models, is that we rely on EBIT as measure of profits for mainly two reasons. Firstly, higher tax rates may, by definition, be negatively correlated with after-tax profits, all else equal (Dischinger, 2010). Second, our approach is mainly designed to examine the transfer pricing channel which is reflected in earnings before interest as opposed to earnings before tax (EBT). In our benchmark model (cf. Eq. (8)), the productivity measure, a_i, is defined as the GDP per capita for each country. We further proxy employee compensation for Labour, l_i, and total fixed assets represent capital, k_i. The composite tax variable, *C*, represent the tax incentive and is derived from Eq. (6). More specifically, the C-measure jointly accounts for tax rates faced by all subsidiaries in all active countries of the MNE, as well as the opportunities for shifting as a function of economic activity in each country. We follow Huizinga and Laeven (2008) and use total revenue as a proxy for economic activity, B_k, in construction of the C-measure.

Profit shifting activities can thus be explained if the result of the regression model yields a negative relationship between the composite tax variable and EBIT while controlling for labour, capital and productivity. Log transforming all variables, except the C-measure, we generate the benchmark model:

$$Log(EBIT_i) = \beta_0 + \beta_1 GDP_i + \beta_2 Labour_i + \beta_3 Capital_i - \hat{\gamma} C_i + u_i$$

The benchmark model restricts the sample to only include manufacturing firms in Europe. The rationale for this is that the widely used Cobb-Douglas function may better represent the earnings compared to, say, technology firms where intangible assets are key drivers of profits. However, it is pivotal in our analysis to get sufficient cross-sectional variation in our sample with respect to development. Hence, we will therefore subsequently expand the model to include all firms and all countries in order to compare the difference. This allows us to evaluate the direct impact of the Cobb-Douglas assumption as well as addressing concerns raised in the literature with respect to bias by only examining European firms.

3.2.2 Panel Data Analysis

As stated in Section 2, profit shifting studies that capitalize on the data availability utilizing panel data estimations have provided more credible estimates according to Dharmapala (2014). Hence, similar to previous studies, we expand the OLS from the cross-sectional model by estimating a panel model including a set of fixed effects for all years in our sample. The result from this section is not directly comparable to the cross-sectional models, given the estimation technique as well as we observe different, but also same, affiliates across years. To reassure our results are in reasonable range, we will therefore mainly compare our results to studies utilizing similar approach on panel data estimations. Firstly, we specify a baseline specification similar to the benchmark model in the cross-section analysis, where we will compare our results to. In line with previous literature, we update the cross-sectional model to represent firm *i* in year *t*, specified as follows:

$$\log(EBIT_{it}) = \beta_0 + \beta_1 Labour_{it} + \beta_2 Capital_{it} + \beta_3 GDP_{it} - \beta_4 \mathrm{C}_{it} + \beta_x X_{it} + \varepsilon_{it}$$

The first benchmark model includes only manufacturing firms located in all countries. Further, we expand the model to include all firms in order to compare the difference between the two groups. Consistent with the cross-section model, the dependent variable is EBIT, labour is proxied by cost of employees, fixed assets are used for capital and GDP per capita accounts for country specific time-variant effects on the productivity parameter, and ε_{it} is an error term. X_{it} is a vector that includes a set of fixed effects in our main model, where we primarily utilize the same fixed effect as previous empirical studies on profit shifting. A common approach to examine profit shifting in developed economies has been to use fixed-effect models, like the within estimator. However, this implies that the cross-sectional data in the sample is decarded (Barrios and d´Andria, 2019). Since we effectively want to analyse different dimensions at the country-level, our preferred model does not include firm fixed effects as this force us to use variation within the specific firm to analyse the effect. Hence, our estimation model therefore includes time dummies which will account for time-specific effects that are common for all firms and affect all countries. Similar to the cross-sectional model, we still include industry dummies to account for industry shocks common to all firms within that industry. To account for time-constant heterogeneity across countries, we apply a set of country dummies which allows us to deal with endogeneity issues related to omitted variable bias in model consisting of unobserved country-specific factors (see e.g., Belitski et al., 2016).

For the few papers examining the role of development, the common approach has been to either run separate regressions (e.g., Crivelli et al., 2016; Fuest et al., 2013; Johannesen et al., 2019) or include dummy variables (e.g., Fuest et al., 2011) in the full sample. Common for both strategies, is that they assume a pre-defined cut-off in order to determine the level of development. Usually, this a sufficient way to get an idea of how the development impacts the tax incentive. To separate the response between level of development, we expand the model to include a simple interaction term with a binary variable representing high-income countries and the composite tax variable:

$$\log(EBIT_{it}) = \beta_0 + \beta_1 Labour_{it} + \beta_2 Capital_{it} + \beta_3 GDP_{it} - \beta_4 \mathrm{C}_{it} + \beta_5 HighIncome_{it} + \beta_6 C_{it}\ x\ HighIncome_{it} + \beta_x X_{it} + \varepsilon_{it}$$

As a step towards a more nuanced understanding of the role of development, we separate the response of the tax incentive into six categories. That is, we divide the sample by creating dummy variables representing firms operating in the percentile 10th-20th (*Category 1*), 20th-40th (*Category 2*), 40th-60th (*Category 3*), 60th-80th (*Category 4*), 80th-99th (*Category 5*), above 99th (*Category 6*), and interact each categorical dummy with the tax incentive to capture the response between the different levels of development. Hence, all interaction effects will be compared to the reference group, that is, lower than 10th percentile:

$$Log(EBIT_{it}) = \beta_0 + \beta_1 GDP_{it} + \beta_2 Labour_{it} + \beta_3 Capital_{it} - \hat{\gamma} C_{it} + \beta_4 Category\ 1_{it} + \beta_5\ C_{it}\ x\ Category1_{it} + \beta_6\ Category2_{it} + \beta_7\ C_{it}\ x\ Category2_{it} + \beta_8\ Category3_{it} + \beta_9\ C_{it}\ x\ Category3_{it} + \beta_{10}\ Category\ 4_{it} + \beta_{11}\ C_{it}\ x\ Category\ 4_{it} + \beta_{12}\ Category\ 5_{it} + \beta_{13}\ C_{it}\ x\ Category\ 5_{it} + \beta_{14}\ Category\ 6_{it} + \beta_{15}\ C_{it}\ x\ Category\ 6_{it} + \beta_x X_{it} + \varepsilon_{it}$$

Building on the previous point, we further seek to measure the relationship in a continuous way. Thus far we have utilized the log of GDP per capita, and although this would capture some non-linearities in an interaction specification, we are interested in applying higher order of polynomial interactions to capture the relationship. Hence, we utilize the total GDP per capita as a continuous operator. The specifications will take the following structure:

$$\log(EBIT_{it}) = \beta_0 + \beta_1 Labour_{it} + \beta_2 Capital_{it} + \beta_3 GDP_{it} - \beta_4 \mathrm{C}_{it} + \beta_5 \mathrm{C}_{it} x GDP_{it} + \beta_6 GDP_{it}^n + \beta_7 \mathrm{C}_{it} x GDP_{it}^n + \beta_x X_{it} + \beta_x X_{it} + \varepsilon_{it}$$

Where GDP_{it}^n represents development proxy and n represents the order of the polynomial.

The second part of this thesis will investigate possible explanations for the results obtained by analysing the role of development, related to country-specific risk. These measures will be presented more in detail in Section 6.

Nevertheless, the investigation approach follows similar procedure as for development, except we are interested in how affiliates exposed to similar risk levels respond to the tax incentive. Therefore, we apply a categorical approach where separate the response to the tax incentive between affiliates operating in different levels of country-specific risk. Specifically, we interact the tax incentive with a categorical variable representing a specific group of courtiers based on similar risk. A step towards providing an explanation would therefore apply the following specification:

$$\log(EBIT_{it}) = \beta_0 + \beta_1 Labour_{it} + \beta_2 Capital_{it} + \beta_3 GDP_{it} - \beta_4 \mathrm{C}_{it} + \beta_5 Percentile_{it}^{n} + \beta_6 \mathrm{C}_{it} x Percentile_{it}^{n} + \beta_x X_{it} + \varepsilon_{it}$$

Where $Percentile_{it}^{n}$ represents all affiliates operating in an environment above the specific percentile of the country-specific risk measure. This allows us to continuously compare the responsiveness to the tax incentive to all other affiliates in less risky countries. Moreover, to disentangle the response between the percentiles, we categorize each percentile representing one category of risk level, allowing us to directly compare the conditional effect on the semi-elasticity of different level of country-specific risk. The latter will be directly designed for each risk measure:

$$\log(EBIT_{it}) = \beta_0 + \beta_1 Labour_{it} + \beta_2 Capital_{it} + \beta_3 GDP_{it} - \beta_4 \mathrm{C}_{it} + \beta_5 Percentile_{it}^{n} + \beta_6 \mathrm{C}_{it} x Percentile_{it}^{n} + \beta_7 Percentile_{it}^{n+1} + \beta_8 \mathrm{C}_{it} x Percentile_{it}^{n+1} + \cdots + \beta_k Percentile_{it}^{k} + \beta_k \mathrm{C}_{it} x Percentile_{it}^{k} + \beta_x X_{it} + \varepsilon_{it}$$

3.3 Limitations

Since our investigation approach implies a log transformation of the dependent variable, we only observe the profitable distribution of affiliates. Recent research has shown that loss-shifting strategy may be an important consideration, which implies that loss-affiliates may actually be a temporary low-tax affiliate since the effective tax rate may be non-positive. Consequentially, MNEs may shift profits from profitable affiliates into loss affiliates, thus reporting smaller losses in the loss affiliates and lower profits in profitable affiliates (De

Simone, Klassen and Seidman, 2016) which may alter the shifting incentive.[7] We are, however, not too concern about the qualitatively interpretations, as most tax planning strategies is something firms decide on ex ante and not ex post. Nevertheless, it is still a limitation as several firm-level observations gets removed and thus reduces our ability to evaluate profit shifting behaviour.

At the theoretical level, our approach would only be precise if accounting data for all affiliates within the same MNE are available. Thus, the applied investigation strategy in this thesis suffers from some important data limitations as well. Firstly, our methodology utilizes a production function which may suffer from incomplete data on firm-level accounts and the missing observations may not be randomly distributed. As discussed by Barrios and d´Andria (2019), Orbis database, in particular, is recognized to have a better coverage of larger countries and smaller firms. This is not an exception in our thesis. Hence, our regression coefficients may suffer from bias as countries, industries or firms with higher coverage in the database get assigned higher weights. Moreover, the coverage of countries where secrecy around accounting statements is higher, such as in tax havens, is scare. According to Tørsløv, Wier and Zucman (2018) only 17% of profits held in tax havens are visible in Orbis. The database's bias against Europe, and advanced countries in general, is also a limitation. In fact, our sample consists of approximately 70% and 90% of respectively, parents and its related subsidiaries located in Europe (see Appendix C2 and C3). Put differently, our results would be heavily influenced by European subsidiaries, but we still believe we are able, to an extent, to measure the responsiveness of global multinational groups.

Nevertheless, the aforementioned data limitations would, if at all, lead to an underestimation of our estimates as better representation of all countries (especially secrecy jurisdictions or tax havens) may lead to more precise and representative tax incentive. Lastly, in line with literature, we simplify corporate tax rates. The tax rate used in the empirical analysis is the top statutory tax rate in each country. In reality, individual tax regimes are complicated and the actual tax rates may for instance depend on specific industry or income brackets. This has not been taken into concern in this thesis.

[7] That is, the MNE may have an incentive to shift profits from a high-tax country to a low-tax country. In the case of a loss-affiliate, this incentive might be distorted if the loss-affiliate is located in a high-tax country.

Summing up, this thesis may suffer from limitations with respect to the preciseness of the tax incentive. However, the aim in this thesis is to provide the reader with a better understanding of how MNEs conduct profit shifting, as opposed to estimating the scale of profit shifting. In addition, we do not seek to explicitly categorize countries into developing, emerging and developed countries, as main objective is to investigate if the relationship is more nuanced. That is, how the tax incentive is affected dependent on level of development of a country, and as we will address in Section 6, how country risk measures may possibly distort the linear relationship between the tax incentive and development.

4. Data

The data section consists of four subsections. We respectively provide a description of our data, sample-selection process, model variables and descriptive statistics. The purpose of this section is to contribute to an understanding of the data used in this thesis.

4.1 Data Sample

In order to evaluate profit shifting in a global setting, the data has been collected from multiple reliable sources which is commonly used in the profit shifting literature. Our sample consists of firm-level accounting data from 2011-2019 on foreign subsidiaries with an identifiable global ultimate owner (GUO). The data is collected from Orbis database, provided by Bureau van Dijk. In this thesis, we define a multinational group as a corporation with a controlling interest in at least one foreign subsidiary. That is, the parent company is required to hold at least 50.01% of the shares of the affiliate, either directly or indirectly. In total, Orbis offers both consolidated and unconsolidated balance- and income statements, for almost 2.6 million subsidiaries with foreign ultimate shareholders and 2 million GUOs worldwide.[8]

Data on corporate income tax rate (CIT) is primary collected from KPMG. However, since all countries in our sample was not covered, we collected data for the remaining countries from, among others, Deloitte, EY, PwC and Trading Economics (see Appendix D1 for details). Given the complexity of different tax regimes, we follow previous literature by only including top statutory tax rates in each country. Specific sector tax rates have not been taken into concern. Moreover, we collected country level data on GDP per capita, total GDP and credit-to-GDP provided by the World Bank (WB) (see Appendix D2 for full list of variables and sources).

As we will address further in detail in Section 6, the country-specific risk metrics are primary collected from the WB. The political stability and absence of violence and control of corruption indices are collected from Worldwide Governance Indicators (WGI) provided by the WB. The indicators were first published in 1996 and are today covering 204 countries. The

8 On October 5, 2020 Orbis covered 278,377,067 active companies, 2,582,409 subsidiaries with foreign shareholders and 2,040,278 GUOs worldwide.

WGI is constructed of 30 different sources, which are then separated into to six sub-indices. The sub-indices used for alternative purposes in the thesis is government effectiveness; regulatory quality; rule of law and voice and accountability. Further, we collected the paying taxes index from Doing Business, also provided by the WB in cooperation with PwC. The index is a part of the Ease of Doing Business report and first published in 2005. Currently, the index consists of 191 countries worldwide.

The original scale of the WGI indices varies from maximum risk of -2.5 to minimum risk of 2.5, whereas the paying taxes index varies between 0 and 100 where the latter represent zero risk. For simplicity, all indices used in this thesis is inverted and transformed to represent the same scale, ranging from 0 (lowest risk) to 100 (highest risk).

4.2 Sample Selection

The raw sample from Orbis provided us with 17,895,870 affiliate-year observations in the time span between 2011 and 2019. Given limitations in the data, we have performed some trimming procedures, where Table 1 summaries the restrictions made. In order to reproduce the study of Huizinga and Laeven (2008) and estimate our benchmark models (cf. Section 3), we mainly rely on their sample restriction method.[9]

Firstly, we included only foreign affiliates with an identifiable link to their GUO. This was obtained directly from Orbis. Further, we extracted the two-digit NACE code for each subsidiary and removed affiliates where the industry classification was not available.[10] Since the NACE code is a European classification, the Standard Industrial Classification (SIC) that is more commonly used in North America was also included. However, there was no signs of improvement to the number of observations removed by including the latter, thus we proceeded by utilizing the NACE code. Moreover, several MNEs had more than one foreign subsidiary located in the same host country. These affiliates were aggregated to represent the groups economic activity in the specific country. From a profit shifting perspective the aggregation makes sense, and Huizinga and Laeven (2008) showed that this does not alter the

[9] Given lack of transparency in detailed trimming procedure, we acknowledge some deviations from their study may occur.

[10] Statistical Classification of Economic Activities in the European Community

relationship between reported and actual profits (cf. Eq. 5).[11] Further, some affiliates in our sample were registered with the parent company located in more than two home countries, which is considered as an Orbis error. This was a small part of our sample and mostly concerned individual owners with lack of basic accounting information as well as residency information. Nevertheless, we manually checked their residency and corrected it (although a small sample was feasible), while the remaining was removed. Since we aggregated all affiliates based on manufacturing and non-manufacturing to reassure the NACE code was as representative as possible, some MNEs had two national subsidiary-year observations. We removed the subsidiaries with the lowest total assets, as a proxy for the importance of the operation in the country. Observations where the CIT and GDP per capita was missing, were removed. Moreover, in the construction of the C-measure, we required solid account information. Hence, negative balance-sheet information and sales was removed. Firms with debt-ratio above one was also removed as negative equity is unreasonable. In addition, since our investigation approach relies on log transformation, all non-positive independent and dependent variables were excluded from our sample. Lastly, we only included firms where we had at least 20% of all subsidiaries in our sample after all restriction.

Table 1: Sample Selection

Steps		World	Europe
1.	Affiliate-years with at least one foreign affiliate in the time span between 2011 and 2019	17,895,870	8,018,937
2.	Aggregation to one national affiliate within the MNE	12,734,736	5,866,702
3.	Orbis error*	12,720,786	5,863,822
4.	Removing conflicting national affiliates	12,417,483	5,729,942
5.	Removing affiliates where balance sheet information was missing	8,886,007	4,982,761
6.	Removing affiliates where the balance sheet information was negative or zero	636,524	425,581
7.	Removing affiliates with negative and zero EBIT	497,123	333,333
8.	Removing MNEs with less than 20% coverage of all subsidiaries in sample	463,125	327,829
	Final Sample	**463,125**	**327,829**

** Affiliates with parent companies located in two or more jurisdictions.*

[11] Huizinga and Laeven (2008) argue that capitalizing on international tax rate differential, the optimal income shifting by MNEs should only depend on the national level of true profits and not true profits among affiliates within same jurisdiction.

4.3 Model Variables

In all specification, the dependent variable is the log of EBIT. Alternatively, we will consider EBT as robustness check. Utilizing EBT implies that we are effectively incorporating the debt shifting channel since pre-tax profits is net financials, which could potentially trigger different incentives. Further, Heckemeyer and Overesch (2017) find that the main profit shifting channel is transfer pricing, and we therefore consider EBIT as the preferred measure of profitability to investigate our research statement.

We proxy the log of employee compensation for labour. We consider the cost of employees as a more precise measure as it accounts for the wage level in each country as opposed to the widely used number of employees. Moreover, capital is replaced by total fixed assets on the assumption that intangible assets are to a large degree difficult to measure accurately. All measures are retrieved from the company´s balance sheet. Lastly, we use GDP per capita as a proxy for productivity to reflect technological development.

In the profit shifting literature, a variety of different tax measures are utilized such as simple statutory tax rate of the affiliate, the parent´s tax rate, average foreign tax rates or unweighted tax rate differentials. We measure the tax incentive MNEs faces by appraising the bilateral composite tax variable, *C*, derived in Eq. (6). The measure is an activity weighted tax rate differential, jointly taking into account all foreign tax rates of related affiliates within the group. In the construction of the C-measure, we proxy economic activity, B_k, by total revenue (turnover). By examining the tax incentive with the C-measure, we are able to better capture the global incentives to shift profits as opposed to a simpler tax rate differential between the affiliate and its parent (Barrios and d´Andria, 2019). Moreover, the meta-study by Heckemeyer and Overesch (2017) find that the use of a worldwide tax measure can alter the estimates significantly. As addressed in Section 4.3, the C-measure is exposed to measurement error. The raw sample from Orbis do not include all possible affiliates of each MNE in our sample, but if so, our restrictions simply remove many of these affiliates due to lack of accounting data. Because MNEs may have an incentive to shift profits into the lowest taxed affiliate within the group, the problem may for example occur if smaller affiliates are located in tax havens where required filings of accounts often are absent. A possible consequence by removing affiliates in the fat tail of the distribution is that it might alter the incentive to shift profits towards a higher taxed affiliate in our sample (leading to a downward bias in the semi-elasticity). Although we believe the C-measure is the most appropriate measure, we will for robustness consider alternative measures of the tax incentive.

As we deliberately expand the benchmark model to investigate our research statement of a possible non-linear relationship between the tax incentive and development, we use GDP per capita provided by the WB. The measure is widely used as a proxy for a country´s welfare and capture the overall development of a country. Alternatively, we will consider credit-to-GDP as a proxy for financial developed for robustness checks. That is, the ratio of private domestic credit to GDP.

4.4 Descriptive Statistics

The final panel data sample consists of 463,125 affiliate-years observations worldwide. In total, there are 175 countries included in our sample, where the majority of companies are located in Europe, while Asia is the second most covered continent (see Appendix C3 for further details). The average MNE in our sample consists of approximately 4 aggregated national foreign affiliates per year. The number of subsidiaries in our sample remains stable in the analysed period, however due to data availability for 2019, the number drops to approximately 2.5 in the last year of our sample. Figure 1 (left) presents how many years each foreign affiliate appears in our sample. The unbalanced panel is due to our strict sample restrictions (cf. Section 4.2), which is reflected in only a small fraction of affiliates are appearing in all years. Despite the aggregation of foreign national affiliates, Figure 1 (right), shows that in each year of our sample, the number of foreign affiliates is higher than the number of parent companies represented by the grey bar. That is, our sample consist of a relatively large share of affiliates that are part of the same multinational group.

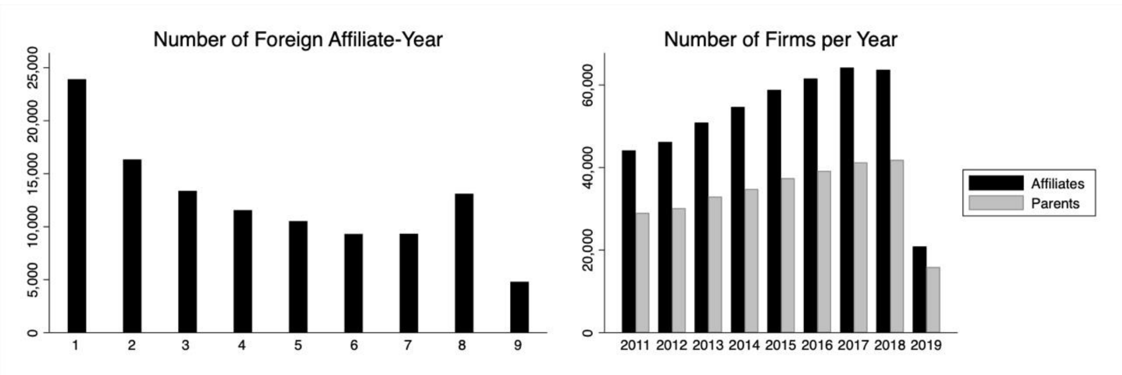


Figure 1: Number of Foreign National Affiliates

Further, Table 2 provides the summary statistics for our panel data.[12] The table includes the mean, the standard deviation, the median, the maximum and the minimum value of the most important variables included in our empirical analysis. Extended summary statistic is reported in Appendix C1.

As expected, the mean value of the bilateral tax measure, *C*, is -0.01 with a median of 0 due to its construction. Specifically, lower tax rates are usually found in countries, which tend to be smaller in terms of market size (Huizinga and Laeven, 2008), and since we use total sales as proxy for economic activity (cf. Eq. 6), this suggests that affiliates in lower-taxed countries accordingly register relatively lower sales.

In our sample, the average CIT in the host country and home country are respectively 23% and 26% (see Appendix C4 for full list of CITs). The latter also entail a larger standard deviation, implying a higher spread in the tax rates where the ultimate owner is located. Moreover, The United Arab Emirates had the highest tax rate in our sample of 55%. The lowest tax rate is 0%, and is applicable to several countries (e.g., Bahamas, Bermuda, Cayman Islands, Anguilla and British Virgin Island).[13] As expected, in the upper distribution of development, there has been a descending trend in the CIT in the years in our sample. That is, tax competition between countries and the rise of tax-haven jurisdictions, has provided governments located in higher taxed countries with an incentive to actively lower the tax rate in order to attract and boost economic activity. This is in line with previous studies on tax competition focusing on developed countries. However, as Mardan and Stimmelmayr (2020) emphasized, less focus has been put on the tax competition in countries with lower levels of development. Interestingly, we see similar trend for the lower and middle distribution of development in our sample.[14] The findings reconcile with Abbas and Klemm (2013) which also find similar downward trend in less developed countries.

Moreover, after our restrictions, the largest multinational group in the sample consists of 35 foreign national affiliates, which is drastically down from prior to our restriction of 86 foreign

---

[12] We refer to Appendix A1 for summary statistics of European MNEs used in the cross-sectional analysis.

[13] All categorized as tax havens by WorldData.info.

[14] Lower distribution: GDP per capita > 25th percentile, middle distribution: 25th<>75th percentile, upper distribution: > 75th percentile

affiliates. Hence, this highlights the strictness in our sample selection. Further, the median multination group consists of only 1 foreign national subsidiary. Meaning, our sample consist of a rather large number of MNEs operating in few countries.

Table 2: Summary Statistics

Statistic	Obs.	Mean	St. Dev.	Min	Median	Max
Firm Characteristics						
Log EBIT	463,125	5.85	2.69	-3.22	5.60	18.93
Leverage	463,125	0.54	0.28	0.00	0.56	1.00
C	463,125	-0.01	0.06	-0.39	0.00	0.64
Capital	463,125	6.50	3.47	-2.66	6.22	21.78
Labour	463,125	6.61	2.72	-6.65	6.53	19.80
NN	463,125	4.03	5.18	1.00	1.00	35.00
TotalSubs	463,125	10.06	14.37	1.00	2.00	86.00
Country Level Variables						
Log GDP	463,125	10.02	0.84	5.76	10.25	12.15
GDP	463,125	29,629.38	20,011.35	315.78	28170.43	189,422.22
CIT i	463,125	0.23	0.07	0.00	0.22	0.55
CIT p	463,125	0.26	0.08	0.00	0.26	0.55

The table reports the number of observations, mean, standard deviation, minimum, median and maximum for the model variables on firm and country level. The data used is set worldwide and goes from 2011 – 2019. Log EBIT is the log of earnings before interest and taxes. Leverage is the affiliates debt-ratio. C is the composite tax variable. Capital is the log of fixed assets. Labour is the log of total cost of employees (labour compensation). NN is the number of foreign national affiliates within the MNE after the sample restrictions. TotalSubs is number of foreign national affiliates within the MNE before sample restrictions. Log GDP is the log of a country´s GDP per capita. GDP is the GDP per capita. CIT i and CIT p is respectively host and home country´s statutory tax rate.

Furthermore, we refer to Appendix C5 for the correlation matrix. However, it is worth noting that EBIT is positively correlated with both capital and labour, indicating that increasing the input factors would in turn increase the output. Further, reported earnings is positively related to log of GDP per capita. That is, more advanced countries are associated with higher EBIT. For example, higher GDP per capita reconcile with higher buying power, and in turn, spur the sales of firms, which could potentially increase earnings.

Moreover, the C-measure is negatively related to reported earnings, which suggests that higher value of *C* (recall from Section 3.1, an incentive to shift profits out of this country) are indeed associated with lower reported earnings. Moreover, the C-measure is positively related to GDP per capita which implies that higher development is associated with higher values of *C*. That is, more developed countries have on average a higher incentive for outward shifting, in optimum.

5. Empirical Results

5.1 Cross-Sectional Analysis: Tax Sensitivity

The cross-sectional analysis builds on the approach designed by Huizinga and Laeven (2008). In line with their study, we control for sector heterogeneity in all specifications henceforth, if not explicitly commented on. That is, we include industry dummies represented by the two-digit NACE code provided by Orbis. The dependent variable in all specifications is the log of EBIT for the year 2015. Consistent with Huizinga and Laeven (2008), we use robust standard errors clustered at the group level, that is valid whether or not there is heteroskedasticity. The clustered standard errors allow for serial correlation within an entity but conducts the errors as uncorrelated across clusters (Stock and Watson, 2012, p. 406).

For comparison reasons, specification (1) and (2) in Table 3 is our benchmark models where we restrict the sample to only include manufacturing firms in Europe with a parent company also located in Europe. This is a pure replication of Huizinga and Laeven (2008) baseline specifications and are of crucial importance in terms of validation of our study. For full replication of their table, see Appendix A2.

The regression carried out in column (1) does not include industry fixed effects, which represent a minimal model. The coefficient of the C-measure is expected to turn out negative, as this will indicate profit shifting behaviour among the MNEs. The model suggests that the coefficient of the tax incentive, *C*, is -1.443, which is highly significant at the 1% level. The estimate is slightly higher than the coefficient from the baseline specification of Huizinga and Laeven (2008), of -1.017. Hence, our results indeed suggest there still exists tax-induced shifting activity. Recall from Section 3.1 that $\hat{\gamma}$ is the semi-elasticity of reported profits with respect to the tax incentive, *C*. Thus, the model suggests that an increase in the tax incentive by 10-percantage points are associated with a decrease in reported profits of approximately 14.4%, all else equal. As expected, both labour and capital are highly significant at a 1% significance level, with coefficients of respectively 0.530 and 0.335. Accordingly, the coefficients can be interpreted as the elasticity of capital and labour, where the sum of the two yields the return to scale. In our case, we observe a decrease in the return of scale with a sum of 0.865, which is close to the results obtained by Huizinga and Laeven (2008) of 0.876. Finally, the log of GDP per capita displays a negative sign. Discussed by Huizinga and Laeven (2008), there are several possible explanations of how economic development could affect profitability. On the one hand, the profitability of firms could benefit from more advanced technology. On the other hand, development may be detrimental on the profitability if the required rate of return is higher for firms operating in less developed countries. Another explanation is that more developed economies may imply higher competition which could drive returns down. Nevertheless, we are not able to conclude on the true relationship as the coefficient is statistically insignificant. Moreover, the benchmark specification yielded an R-squared of 0.75, implying the model explains the variation in EBIT in a relatively good way.

The regression presented in column (2), is carried out on the same sample as the regression in column (1), but we now include industry fixed effects to account for sector heterogeneity. Comparing the results to the latter, suggest very similar output, but the semi-elasticity has decreased to -1.38. Moreover, the result from an *F*-test, suggest a rejection of no significance of the industry fixed effects. This is reasonable as there might be differences in deployment of the input factors among manufacturing industries. Overall, our benchmark model is reconciling with the results obtained by Huizinga and Laeven (2008).

Table 3: Cross Sectional Analysis: Tax Sensitivity

	EUROPE		WORLDWIDE	
	(1) Manufacturing Firms	(2) Manufacturing Firms	(3) Manufacturing Firms	(4) All Firms
Labour	0.530***	0.528***	0.530***	0.509***
	(0.012)	(0.013)	(0.011)	(0.005)
Capital	0.335***	0.316***	0.342***	0.305***
	(0.009)	(0.010)	(0.008)	(0.003)
Log GDP	-0.017	-0.046*	-0.101***	-0.051***
	(0.025)	(0.025)	(0.013)	(0.007)
C	-1.443***	-1.381***	-1.116***	-0.923***
	(0.247)	(0.245)	(0.169)	(0.095)
Observations	9,594	9,594	14,297	58,553
R-squared	0.746	0.756	0.768	0.742
Industry Fixed Effects	No	Yes	Yes	Yes
F-test of no significance of industry dummies (p-value)		0.00	0.00	0.00

*The table reports the OLS estimation based on Eq. (8) for the year 2015. The dependent variable is the log of EBIT. Capital is the log of fixed assets, Labour is the log of total cost of employees, Log GDP is the log of GDP per capita and C is the composite tax variable. Regression 1 and 2 includes only manufacturing firms in Europe. Regression 2-4 controls for industry fixed effects. Regression 3 includes manufacturing firms in all countries in our sample. Regression 4 includes all firms and all countries in our sample. Standard errors clustered at the group level are reported in the parenthesis. ***, **, * respectively denotes significance level of 1, 5 and 10%.*

Further, in column (3) we include manufacturing firms in all countries in our sample. While the C-measure is still significant and negative, we obtain a lower tax sensitivity of -1.12, compared to the benchmark with only European MNEs. The model suggests that a change in the tax incentive by 10-perentage points are associated with a change in reported earnings by only 11%, all else equal, as opposed approximately 14% from column (1-2). This suggests that the cross-sectional analysis only focusing on European firms may be somewhat biased, which is supportive of the concerns raised in previous literature. However, the concerns raised in the literature has usually been centred around a possible downward bias by only examining European MNEs, which contradicts our findings. A possible explanation for this could be selection bias in our sample. That is, the reported accounting data for the additional countries we are able to include may not be randomly distributed. Worth noting, the study of Huizinga and Laeven (2008) only included 29 countries, while our sample includes 38 countries in Europe. Hence, we should exercise some caution interpreting the difference.

Moreover, in column (4), we lex the restrictions from our benchmark by not limiting our sample to only manufacturing firms. The semi-elasticity is still statistically significant at 1% level but decreased in scale to approximately -0.92. There might be many reasons for this, such as different industries may have different ability or incentive to shift profits. For example, a unique product with no clear market-parallels, makes it harder for the tax authorities to justify restrictions on the transfer price in accordance with the ALP. Further, the explanation power of the model reduces somewhat, as expected due to the Cobb Douglas assumption.[15] Nevertheless, the results coincide with the robustness test performed by Huizinga and Laeven (2008) where they also report a lower sensitivity when including all industries. Furthermore, the input factors labour and capital are of similar magnitude and significance. In fact, productivity measure, *Log GDP*, is now significant at the 1% level and negative, suggesting a detrimental effect of development. Moreover, the overall results by including all firms did not alter the model too much, which enhances the confidence of including all firms in our sample for the purpose of this thesis.

To summarize, the cross-sectional analysis coincides with the results provided by Huizinga and Laeven (2008) for the year 1999. Evaluating all firms worldwide, the semi-elasticates on only European MNEs suggests a potential upward bias. However, difference between European and global MNEs is not considerable. Moreover, we are careful not to explicitly comment on the specific direction profit shifting has evolved through the years due to endogeneity specifications performed by Huizinga and Laeven (2008) that has not been

[15] That is, other firms may not be as accurate represented by the input factors such as technology firms where capital (fixed assets) are not that important relative to intangible assets such as intellectual property.

conducted.[16] In addition, our sample also consists of more countries within Europe compared to their study, which could therefore lead to inconclusive interpretations of the trend. Nevertheless, our results are strikingly similar, and thus enhances the confidence in our sample procedure.

5.2 Panel Data Analysis: The Role of Development

To investigate the role of development on the tax sensitivity, we expand the OLS for all years and include a set of fixed effects to the model. Firstly, we account for unobserved time-specific effects over the period 2011-2019 that are common to all subsidiaries and affect all countries (with same magnitude) for a given year. This is done by including a set of dummy variables representing each year in the sample. Further, it is important to account for heterogeneity across countries, which allow us to deal with endogeneity issues related to omitted variable bias consisting of unobserved country-specific factors (e.g., Belitski et al., 2016). We thus include a dummy for each host country to control for the time-invariant unobserved heterogeneity. To control for industry shocks, we continue to include industry fixed effects. Moreover, we use robust clustered standard errors at the group level, which allow for heteroskedasticity and for arbitrary autocorrelation within a cluster but conducts the errors as uncorrelated across clusters (Stock and Watson, 2012, p. 406).

The regression presented in column (1) Table 4, is the first benchmark model including only manufacturing firms located worldwide, similar to the estimation strategy under the cross-sectional analysis. Controlling for industry-year fixed effects in column (1) we obtain a statistically significant and negative coefficient of the C-measure. The point estimate of -0.77 is smaller in scale, consistent with previous literature utilizing similar approach on panel data estimation on European MNEs. That is, semi-elasticity estimates in the range of -0.4 and -0.8 (cf. Section 2).

By including all firms in column (2), we obtain similar result with a semi-elasticity of approximately -0.75. Considering the result from the cross-sectional analysis, we will for the purpose of this thesis include all firms as the effects do not seem substantial. Adding to column

[16] We have assumed that tax policy is exogenous to earnings, while in practice, it may to an extent be endogenous (Huizinga and Laeven (2008)). Nevertheless, performing an instrumental regression, they find a downward bias in the baseline semi-elasticity. This could possibly indicate that our results, if any, are underestimated.

(2), we include country fixed effect in column (3) to deal with endogeneity issues related to omitted variable bias in column (2) consisting of unobserved country-specific factors. The point estimate of the tax incentive is still significant, but somewhat lower than in the two previous models, of -0.58, suggesting an omitted variable bias problem by not including country fixed effects. The productivity measure is now positive and statistically significant at the 1% level, implying that higher development is associated with higher reported earnings.

In the subsequent regressions, we expand the baseline specification to investigate the main research statement of whether there exists a non-linear relationship between the tax sensitivity and development of country.

The regression presented in column (4), tests whether development is negatively related to the tax sensitivity in a linear specification. We appraise a similar approach as Johannesen et al. (2019) where we separate the responsiveness between low-/middle- and high-income countries. That is, the *High Income* dummy indicates whether the affiliate is located in a host country with a log of GDP per capita above the 75th percentile in our sample. The interaction term between the *High Income* dummy and the composite tax incentive, *C*, is statistically significant and positive. Specifically, the model suggests the lower-income countries face a semi-elasticity of -0.76, while high-income countries face a semi-elasticity of -0.09 of (= -0.76+0.671), all else equal. Hence, moving from lower-income to high-income countries would on average decrease the tax sensitivity by 88% (= 0.671/-0.761). Based on previous research, this strengthens our suspicion that high-income countries, on average, are less sensitive to changes in the tax incentive relative to lower-income countries by this definition.

Despite that the high-income dummy reveals information about how the upper distribution in terms of development respond to the tax incentive, the true relationship may be more nuanced. Hence, the simple categorization may be inconclusive due to its construction. To further investigate our research statement, column (5) seeks to shed lights on the potential non-linear relationship while controlling for unobserved time-invariant effects. As a step towards a more nuanced understanding of the role of development, we separate the response of the tax incentive into six categories. The reference group is affiliates in countries in the lower 10th percentile of GDP per capita. We are careful not to include more categories than necessary as the result could be driven by very few observations. The categories are respectively 10th-20th, 20th-40th, 40th-60th, 60th-80th and 80th-99th percentile in our sample. In addition, it would be interesting to see how the very most advanced countries in our sample behave, thus we include affiliates in countries above the 99th percentile as well.

Table 4: Panel Data Analysis: The Role of Development

	(1) Manufacturing Firms	(2) All Firms	(3) All Firms	(4) All Firms	(5) All Firms
Labour	0.527***	0.499***	0.485***	0.484***	0.481***
	(0.007)	(0.003)	(0.003)	(0.003)	(0.003)
Capital	0.351***	0.315***	0.299***	0.299***	0.300***
	(0.006)	(0.002)	(0.002)	(0.002)	(0.002)
Log GDP	-0.089***	-0.044***	0.197***	0.215***	0.054
	(0.009)	(0.005)	(0.036)	(0.036)	(0.040)
C	-0.768***	-0.747***	-0.579***	-0.761***	-0.697***
	(0.114)	(0.069)	(0.083)	(0.090)	(0.166)
High Income				-0.025***	
				(0.008)	
High Income x C				0.671***	
				(0.135)	
GDP 10-20					-0.017
					(0.024)
GDP 10-20 x C					-0.043
					(0.231)
GDP 20-40					0.107***
					(0.029
GDP 20-40 x C					-1.177***
					(0.212)
GDP 40-60					0.111***
					(0.033)
GDP 40-60 x C					-0.487**
					(0.222)
GDP 60-80					0.140***
					(0.037)
GDP 60-80 x C					1.498***
					(0.211)
GDP 80-99					0.168***
					(0.039)
GDP 80-99 x C					0.496**
					(0.219)
GDP 99					0.168**
					(0.073)
GDP 99 x C					4.285***
					(1.280)
Observations	110,992	463,125	463,125	463,125	463,125
R-squared	0.763	0.737	0.748	0.748	0.748
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	No	No	Yes	Yes	Yes

*The table reports the OLS estimation from the panel data, based on Eq. (8). The dependent variable is the log of EBIT. Capital is the log of fixed assets, Labour is the log of total cost of employees, Log GDP is the log of GDP per capita and C is the composite tax variable. Regression 1 and 2 includes, respectively, manufacturing and all firms while controlling for industry-year fixed effects. Regression 3–6 includes all firms and accounts additionally for country fixed effects. Regression 4 includes a dummy variable for observations with log of GDP above the 75th percentile, as well as an interaction term with C-measure. Regression 6 divides the GDP into pre-defined groups. Standard errors clustered at the group level are reported in the parenthesis. ***, **, * respectively denotes significance level of 1, 5 and 10%.*

The model´s prediction suggests that affiliates in the *lower* 10th percentile of development have on average semi-elasticity of approximately -0.7. Further, the model suggests the tax sensitivity increases substantially in lower-middle of development (20th-40th) with an additional semi-elasticity of -1.18. Further, increasing development to the 60th percentile suggest the curve ascends to a lower sensitivity, but still larger than the reference group.

Unexpectedly, the upper-middle (60th-80th) faces a positive semi-elasticity of 0.8 (= -0.697+1.498). Interestingly, the model suggests the curve descend again at the 80th-99th before it reverts upwards in the most advanced countries.

Specification (5) reveals some interesting features of the relationship between the semi-elasticity and the level of development of a country. Countries in the range of 20th-40th percentile are especially prone to profit shifting, whereas affiliates in the 60th to 80th are least affected by the tax incentive. A possible caution should be directed to the affiliates in the 60th-80th and above 99th percentile of development in our sample as they face a positive semi-elasticity according to the model which is counterintuitive.

To see how the incentive changed, consider the following. Recall, a *negative* C-value for an affiliate, by its construction (cf. Eq. 6), implies an incentive for inward profit shifting. Our model suggests the expected response for an affiliate in the 60th-80th percentile to a 10-percentage point decrease in the C-measure (i.e., incentive to shift profits inward) would on average *decrease* earnings by 8% as opposed *increase* earnings.[17] The semi-elasticity is also positive for the most advanced economies above 99th percentile. However, a possible explanation for the latter, could be the results are driven by a very small number of firms in the top percentile and thus reduces the model's predictability to reflect the relationship.

For this reason, it would be interesting to shed lights on the non-linearities in a continuous way. Since a log transformation of the GDP per capita capture some of the non-linearities in a continuous interaction, we find it more appropriate to use the total GDP per capita as a continuous operator as we specifically want to check higher order of polynomial interactions. In Table 5 we subsequently specify development as GDP per capita and interact each measure of development with the semi-elasticity.

[17] A possible explanation could be that in the upper-middle of development, loss carry forward may be more prevalent and thus reduces the tax sensitivity drastically. However, incentive is inverted and may not explain the descending trend in sensitivity for 80th-99th.

Table 5: Polynomial Interaction between Semi-Elasticity and Development

	(1) Linear	(2) Quadratic	(3) Cubic	(4) Quartic
Labour	0.484***	0.484***	0.483***	0.482***
	(0.003)	(0.003)	(0.003)	(0.003)
Capital	0.299***	0.299***	0.300***	0.300***
	(0.002)	(0.002)	(0.002)	(0.002)
C	-1.337***	-1.404***	-0.930***	-0.003
	(0.132)	(0.167)	(0.204)	(0.277)
GDP	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
GDP x C	0.000***	0.000***	-0.000*	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
GDP^2		-0.000**	-0.000***	-0.000***
		(0.000)	(0.000)	(0.000)
GDP^2 x C		-0.000	0.000***	0.000***
		(0.000)	(0.000)	(0.000)
GDP^3			0.000***	0.000**
			(0.000)	(0.000)
GDP^3 x C			-0.000***	-0.000***
			(0.000)	(0.000)
GDP^4				-0.000
				(0.000)
GDP^4 x C				0.000***
				(0.000)
Observations	463,125	463,125	463,125	463,125
R-squared	0.748	0.748	0.748	0.748
Year Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes

*The table reports the OLS estimation from the panel data, based on Eq. (8). The dependent variable is the log of EBIT. Capital is the log of fixed assets, Labour is the log of total cost of employees, GDP is the country´s GDP per capita and C is the composite tax variable. For each of the four regressions we include GDP raised to the power of 1, 2, 3 and 4 for respectively regression 1, 2, 3 and 4. All orders of the GDP measure is interacted with the C-measure. Standard errors clustered at the group level are reported in the parenthesis. ***, **, * respectively denotes significance level of 1, 5 and 10%.*

As expected, the interaction coefficient is too small in scale to be presented in the regression table. Hence, the result from the regression is best interpreted through a graphical visualisation. Utilizing the regression output, we compute the slope for EBIT on the tax incentive, C, while holding the value of the moderator, GDP per capita, constant at values running from the minimum to maximum. That is, the plots below show us the amount of change in EBIT by one-unit change in C, holding the GDP per capita constant. All other variables are held constant at their mean value.

In specification (1), the linear interaction term is statistically significant and displays a positive sign, illustrated in the upper left of Figure 2. The line in the plot is consistent with previous specifications, suggesting a simple negative relationship between the semi-elasticity and development. Further, specification (2) reveals that the relationship may be concave. However, the highest order of interaction term in this regression is insignificant, and inference should be exercised with caution. Considering the results from Table 4 above, we expect a U-shaped curve in the lower to middle of development before it descends again. Hence, the interaction specification in column (3) allows for a cubic movement as well as a quartic movement in column (4). Both models suggest all orders of interactions are statistically significant. Displayed in the lower part of Figure 2, we obtain a similar pattern to the categorical approach in Table 4 column (6). As previously stated, the last descending trend in the plot to the right should be exercised with some caution as the number of observations at these levels of development are limited. In fact, less than 1% of our sample have a GDP per capita above 102,000.

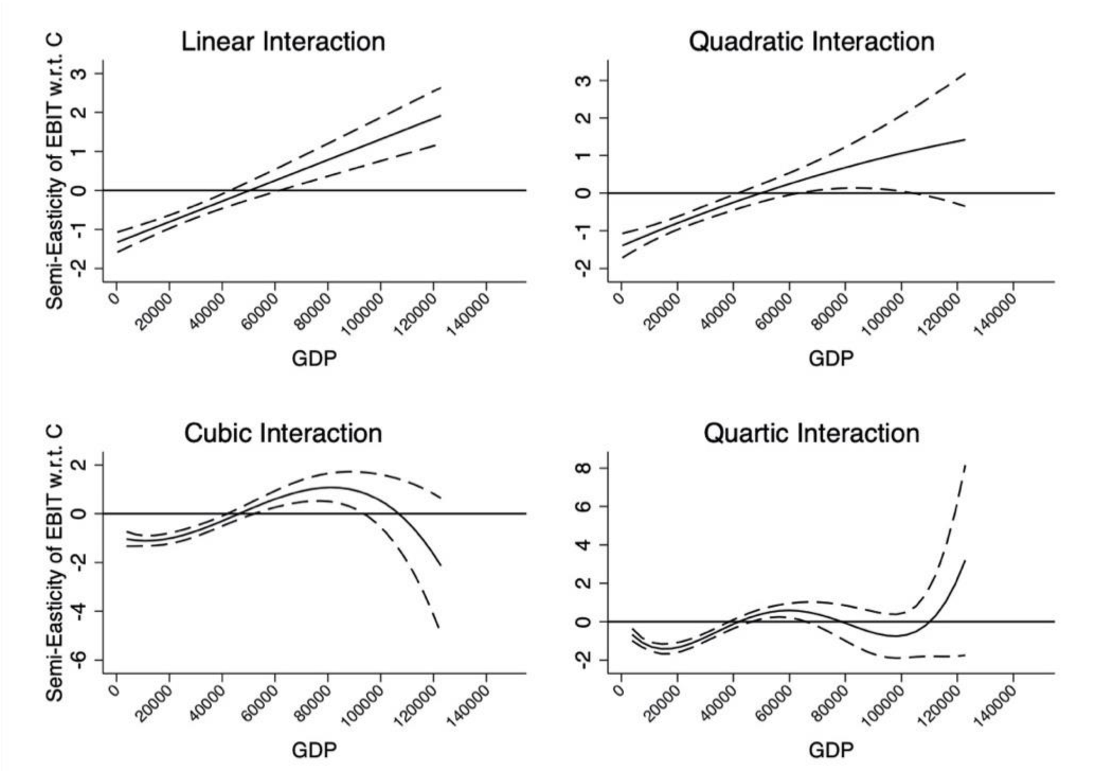


Figure 2: Polynomial Interaction between Semi-Elasticity and Development

Nevertheless, the continuous interactions of higher order polynomials do indeed suggest the lower-middle of development face the highest tax sensitivity. Although we see a descending trend after the upper-middle, the dotted lines show that the semi-elasticity is not statistically different from zero at a 95% confidence interval for affiliates above the 99th percentile in our sample. Worth noting, the concavity in the slopes for the cubic and quartic specifications starts in the range of a GDP per capita of approximately 40,000-50,000. Also, the plot reveals that some affiliates face a slightly positive semi-elasticity, consistent with Table 4, but contrary to our beliefs.

The consensus in the literature, that the lack of resources and capacity in tax administration to implement effective anti-avoidance rules, may not solely explain why the lower-middle of the distribution are most prone to profits, nor why we see an ascending trend in the tax sensitivity for the least developed countries, according to our models. Also, it may not explain the slightly positive semi-elasticity the affiliates in the range of 40,000-50,000 in GDP per capita face. In fact, these results are counterintuitive and have not been found in previous literature.

To summarize, our models do indeed suggest indirect evidence of profit shifting. Utilizing simple high-income categorization, we find that affiliates located in high-income countries have on average a semi-elasticity of approximately 88% less than the lower-income countries. Countries in the lower-middle of development are especially prone to profit shifting, affiliates in the least developed countries face a slightly lower tax sensitivity relative to the latter, while affiliates in the upper-middle of development face a counterintuitive positive semi-elasticity.

These findings are interesting as previous literature usually have paid attention to a simple categorization of developing versus developed economies. Indeed, our results suggest there is a negative relationship between development and tax sensitivity, but our specifications suggest there is a non-linear relationship. Based on our findings, the conventional approach to measure tax sensitivity in a linear way, might not be sufficient to reflect the true relationship. Hence, these results offer room for further investigation.

6. Explaining Non-Linearities

The non-linearities presented in the previous section raises some interesting questions in regard to the tax planning strategies of MNEs. According to our findings, affiliates in the upper-middle of the distribution respond to the C-measure in the opposite direction. That is, a positive semi-elasticity, which is counterintuitive based on previous research. Further, the very least develop countries faces a lower tax sensitivity than lower-middle of the distribution. Hence, the standard argument that less developed countries lack capacity in the tax administration, may not solely explain our findings. We therefore proceed by investigating three potential country risk factors that may contribute explaining the non-linearity. Specifically, we examine compliance costs, corruption in the tax administration and political uncertainty. Firstly, we consider the intuitions for the latter risk variables used in the subsequent analysis. Secondly, to test the potential explanations, we expand the OLS where we are mainly interested in how affiliates exposed to similar risk levels respond to the tax incentive. Therefore, we apply a categorical approach where we separate the response to the tax incentive between affiliates operating in different levels of country-specific risk.

6.1 Theoretical Considerations and Country Risk Data

To analyse possible explanations for the non-linearities with respect to the country risk measures addressed above, we will mainly rely on the WGI provided by the WB. The main advantage of WGI is that it divides the overall institutional risk into different subindices allowing us to disentangle different sources of country risk. In this way, we are able to effectively evaluate the sources and indicators determining the subindex. Further, the data for the subindices covered all countries in our data sample, thus we are not limiting the cross-sectional variation in our data. However, a common concern is the high correlation between the different subindices within the WGI. Nevertheless, calculating the yearly change in the indices, the correlation drops to 0.16 to 0.53 (see Appendix C6). Similarly, the correlation of the standard deviation of change over time, resulted in a range of -0.03 to 0.48. We therefore have confidence that utilizing these indices, our results should mainly be driven by changes in the specific subindex as opposed to changes in other subindices.

As stated in Section 2, researchers have been focusing either on how risk affect profits, or how taxes affect profits. The vast empirical literature on the latter provides significant evidence of a negative effect of taxes on profits, while the literature on risk on profits, are more disperse. For example, evidence has been provided that corruption can facilitate growth in some environments, while in other environments, a detrimental effect is most prevalent. As Meon and Weill (2010) suggests, the grease theory comes in both weak and strong form. Specifically, corruption is less damaging to institutions which are less effective and may even yield positive consequences in very ineffective institutions. Combining tax and risk, Belitski et al. (2016) find that corruption may offset negative effects of tax policies on entry in certain environments. Motivated by the findings of Bilicka and Seidel (2020) that corruption may facilitate profits shifting in Europe, we seek to investigate the mechanisms at play in more detail.

Firstly, since most of the costs associated with profit shifting implies interactions with the tax authorities, the effectiveness of governments is reasonably assumed to have an influence beyond the specific anti-avoidance rules. A financially constrained or less sophisticated government body may contribute to a longer legal process or investigation, which entail higher legal cost for the MNE. In addition, firms operating in environments with underdeveloped regulations could face unreliable and inconsistent contract enforcements and higher costs related to compliance and negations. For example, complex or poorly developed tax systems may impose high costs due to invested time and resources to comply with the regulations. Hence, we expect that the regulatory burden imposed on MNEs by the tax authorities should increase the compliance costs associated with profit shifting and thus reduce the tax sensitivity of profits if the costs exceed the benefits. To analyse this effect, we proxy compliance costs and underdevelopment of the tax system by utilizing the paying taxes index constructed by the WB and PwC. The index is capturing the number of taxes and contribution tax paid, hourly time spend per year to prepare, file and pay taxes. Further, it also incorporates the amount of taxes as share of commercial profits as well as post-filing index which capture the time to comply with refund and corrections. Hence, this allows us to measure the compliance costs or the regulatory burden tax systems may impose on firms in the specific country.

Furthermore, the structure of the system may as well serve as an incentive for firms to circumvent the complex or inefficient regulations or speed up the process if bribes are an option. That is, corruption in the tax administration should reduce the costs of profit shifting, and thus spur the incentive to engage in shifting activity. Moreover, to reduce the effective tax rate of an affiliate, the marginal bribe rate should be below the marginal tax rate in that specific country (Olken and Pande, 2012). Analogously, if the government requires bribes that are not directly related to the tax liability, this will indirectly impact the marginal effective tax rate faced by the affiliate. Hence, if the main purpose of the operation in this specific country is to reduce the tax bill, then this needs to be weighed against non-tax-related corruption as well. Following this intuition, too much corruption may imply more non-tax related bribes which will accordingly increase the marginal effective tax rate. Ultimately, this could potentially reduce the tax sensitivity. Hence, we expect corruption to increase the tax sensitivity in moderate to high levels, while reduce the tax sensitivity at very high levels.

To investigate this, we use the control of corruption index from WGI, as a proxy for corruption in the tax administration.[18] A common perception is that corruption remains quite stable across time within countries and has thus raised concerns of the ability for standard corruption indicators to capture variation in shorter periods (Bilicka and Seidel, 2020). In Figure 3 (left) we have plotted the control of corruption score for all countries in our sample for the year 2011 on the horizontal axis against their control of corruption score in 2018. The countries furthest from the line, reported the largest deviation in corruption in this time span.

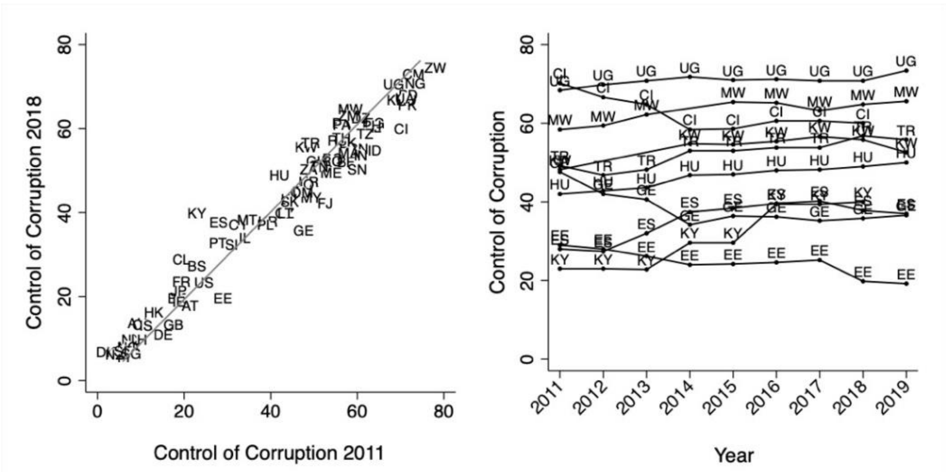


Figure 3: Variation in Corruption

[18] The index tries to capture the extent to which public authority is exercised for private gain (Kaufmann, Kraay and Mastruzzi, 2010). As a supplement, we downloaded WBES survey which measures the percentage of firms expected to give gifts in meetings with the tax officials. However, the data availability only covered a limited number of countries in our sample and has not been conducted every year. Thus, we estimated the correlation between the WBES survey and the control of corruption index. This yielded an approximate correlation of 0.73 for the year with most coverage, 2013. Performing the same correlation between the widely used CPI-index by Transparency International, we obtained a lower correlation of 0.6. Although the WBES survey might be a better proxy for corruption in the tax administration, we believe that the control of corruption index is a good approximation. For robustness tests, we will consider WBES index as well as CPI-index.

In countries with low corruption, the datapoints is centred close to the plotted line. Meaning, the absolute change has been quite stable from 2011-2018. Further, more corrupt countries display on average larger fluctuations. That is, moving up in corruption level, the change becomes more disperse, suggesting riskier countries on average are exposed to larger variation in corruption. This becomes evident in Figure 3 (right), where we see the yearly corruption level on a selected number of countries. For instance, countries which experienced the largest increase in corruption in our sample are Cayman Island, New Zealand, Chile and Spain. Respectively, the absolute change from 2011-2018 was 74%, 60%, 49% and 35%. Hence, the corruption level may involve within variation and thus of importance when measuring the effect on the tax sensitivity across time for firms operating in these environments. The figure also illustrates that our sample consist of affiliates operating in both ends of the spectrum and thus enhancing the cross-sectional exposure in our sample. Lastly, it is interesting to see corruption in the very most corrupt countries has mostly experienced a decrease in the analysed period (i.e., below the 45-degree line).

Moreover, the worldwide presence of MNEs implies a need to adopt to various political environments as well. That is, exposure to different risks related to politics based on the country of operation. Clearly, these risk exposures may take different forms and thus should be incorporated in the decision making for MNEs to shift profits or make foreign direct investments in general. First and foremost, political risk may cause uncertainty. Previous studies on uncertainty surrounding political risk suggests that this may be a more important determinant than the political risk itself (cf. Section 2). For example, uncertainty caused by unstable political environment may decrease the predictability of future earnings, for instance through higher likelihood of unforeseeable non-operational costs such as expropriation.[19] However, in stable political environments, these costs (or earnings) may be more foreseeable. Therefore, the risk of running unexpected losses should be lower in stable environments relative to unstable environments. Hence, we expect that MNEs with affiliates operating in unstable environments should be *less able* to set abusive transfer prices as they run the risk of

[19] When an MNE have made an investment in a country it is exposed to mainly two types of expropriation, where the most direct form is outright nationalization. That is, MNE loses the investment and the government take complete control of the project and thus the expected earnings. However, this strong form of expropriation seems to be less prevalent today (e.g., Kesternich and Schnitzer, 2010; Schnitzer, 2002). A more indirect form of expropriation is where the government tries to game the rules to capture quasi-rents of the investment (Schnitzer, 2002), usually referred to creeping expropriation or discriminatory taxation.

jeopardizing the overall objective of minimizing the global tax bill. Put differently, political uncertainty should reduce the tax sensitivity as the predictability decreases.

To try to isolate the effect of political turmoil on the uncertainty facing MNEs, we use the political stability and absence of violence index, provided by the WB.[20] Similar to corruption, it is commonly accepted that political risk within a country remains rather stable across time. To show this is not the case, we plot the risk level for each country. Figure 4 reveals that there is variation within the countries in our sample. The plot separates low-risk countries by average political risk from 2011-2019 below the 1st quantile and high-risk above the 3rd quantile. Middle-risk countries represent the quantiles between the latter. Note that low-risk countries fluctuate around a score of 20-30, while riskier countries are more dispersed, both for middle-risk and high-risk. This suggests that environments with higher political risk, on average, may represent more uncertainties ex ante. Because uncertainty surrounding political risk is well represented in the middle-risk countries as well, we proxy uncertainty by estimating the yearly change in political risk.[21]

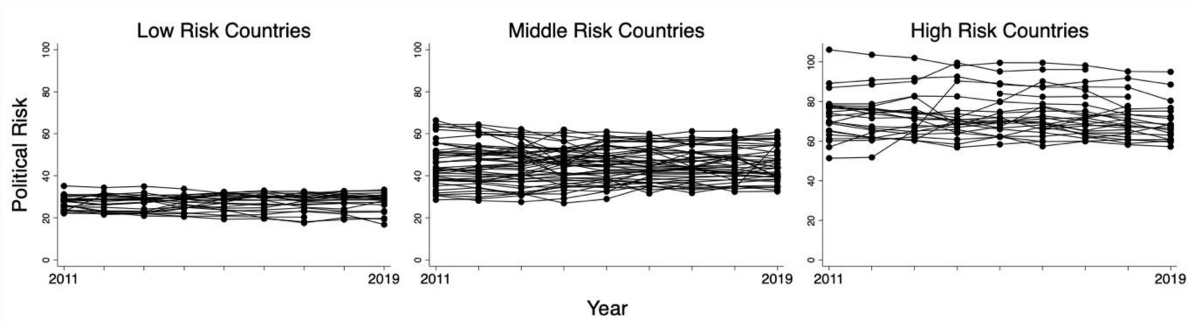


Figure 4: Variation in Political Risk

Despite being calculated from the political risk index, the correlation between the change in political risk is never above 0.08 between the variables in our sample, nor higher than 0.008 between changes in other sub-indices in our sample (see Appendix C6). This enhance our confidence that the uncertainty is primarily driven by political uncertainty as opposed to the

[20] The index is measuring the perception of political instability and to what extent violence is political driven (Kaufmann et al., 2010).

[21] Data on political risk for 2010 was collected in order to estimate the yearly change for the year of 2011.

absolute level of political risk or changes in other risk levels. Worth noting, it is not to rule out there are other unobserved factors that correlate or drive the change in political risk. Also, it could be other uncertainty aspects which may trigger different incentive with respect to profit shifting. Hence, we utilize different measures for robustness.

Lastly, we refer to Appendix C1 and C5 respectively, for full summary table and the correlation matrix for the additional variable presented in this section. However, there are some important considerations with respect to the risk variables mentioned. Our proxy for development is negatively related to all risk variables in our sample, except changes in political risk. In addition, all risk measures, except the change in political risk, are negatively related to reported earnings. This suggests the higher compliance costs, higher political risk and higher corruption are associated with lower level of development as well as lower reported earnings. Interestingly, the data points in the direction of higher yearly increases in political risk are associated with higher levels of development, and higher earnings as opposed to lower earnings. The reason is that we have affiliates in the middle distribution of political risk which also experienced higher increases in political risk (cf. Figure 4). Since development is positively related to earnings and negatively related to all of our risk variables, the latter argument can be applied with respect to development. That is, the middle distribution of development in our sample experienced large increases in political risk and reported higher earnings on average relative to less developed countries.

To see this, we plot political uncertainty against GDP per capita, in Figure 5. Respectively, the plots show the year-to-year change in political risk for each country in our data sample on the left, and average yearly change in political risk on the right. The plots reveal some interesting features of political uncertainty related to the non-linearities we observed in Section 5. Both plots suggest that the political uncertainty is lower countries with GDP per capita in the range of 20,000-40,000, which reconcile with roughly the minimum point in the non-linearity plots. In addition, we notice that the political risk increases as development moves away from the minimum point. Specifically, the plot to the left shows that the political risk in the least developed countries is in fact quite centred around 1 (i.e., no change), but driven by extreme year-to-year increases in political risk. Notably, this particular group of countries also seems to dominate the yearly decrease in political risk as well. Interestingly, the plot to the right shows that countries with an GDP per capita of approximately 40,000, which represent the upper-middle of distribution in our sample, experience *on average* larger changes in political risk. This relates to the concavity and the counterintuitive results obtained in the non-linear plots.

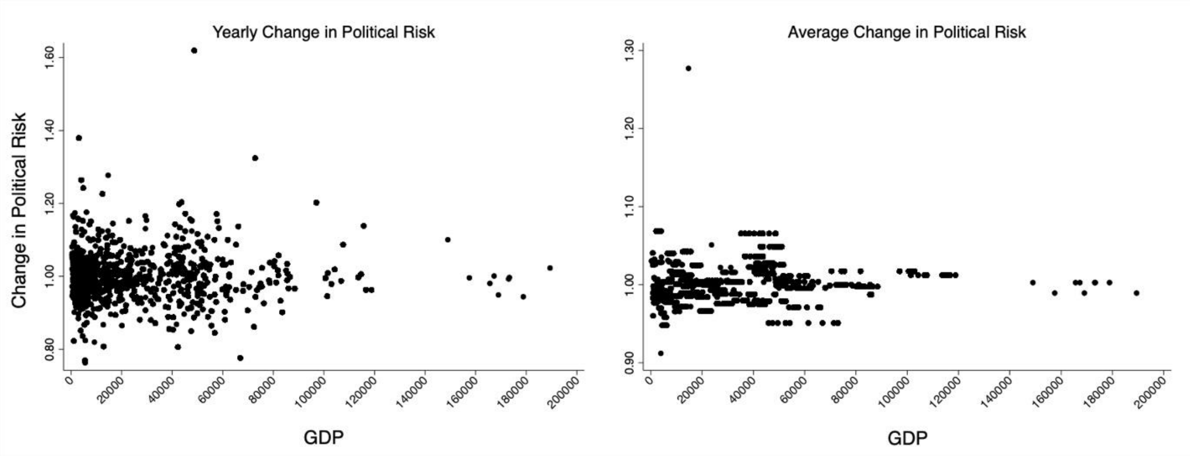


Figure 5: Political Volatility against Development

6.2 Political Uncertainty

Regression (1-3) presented in Table 6 are designed to compare how affiliates operating in similar volatile political environments, respond to the tax incentive. *Percentile* is a dummy variable indicating whether the affiliate is located in a country where the yearly change in political risk is above the percentile of interest. With respect to the reasoning in the previous section, we are only interested in the top percentile, that is, we want to measure increases in political risk as opposed to decreases. Further, we interact the percentile dummy with C-measure to capture the responsiveness to the tax incentive between two groups. Although carried out in the subsequent regressions, we do not report the Cobb-Douglas input factors, nor the productivity measure as we are mainly interested in the direction of the risk measures.

In column (1), we interact a binary variable representing countries which experienced an increase in political risk from the previous year above or equal to the top 75th percentile of all countries in our sample. The C-measure is still significant at 1% level suggesting that, on average, affiliates experienced a *lower* change in political risk (reference group) respond to a 10-percentage point decrease in *C* by increasing earnings of approximately 6.5%, all else equal. The interaction effect, however, suggests affiliates which experienced a large change in political risk in fact are less responsive to the tax incentive. The same decrease in *C*, suggest a 2.5% lower increase in earnings compared to the reference group. In column (2), we increase the strictness and apply the same dummy for affiliates above or equal to the 90th percentile. The results suggest that affiliates experienced a *lower* change in political risk than the 90th percentile, respond by increasing earnings by 6.2%, while affiliates above, reduces earnings by additionally 3.8%, on average. Interestingly, in column (3) we are not able to differentiate the responsiveness between the reference group and affiliates above the 95th percentile, which contradicts our prediction.

To disentangle the response between the aforementioned percentiles, we separate each group into four categories. The reference group represent affiliates in countries which experienced a *lower* increase in political risk than 75th percentile. *Category 1, Category 2, Category 3* represent respectively the following percentiles: 75th-90th, 90th-95th and above 95th. The model suggests that moving from the reference group to Category 1 (Category 2) are associated with a decrease in the semi-elasticity of approximately 26% (102%). Unexpectedly, the semi-elasticity for the affiliates exposed to the largest increase in political risk (Category 3) are not statistically different from the reference group. That is, the tax sensitivity is higher compared to the aforementioned groups.

Interestingly, our model predicts that affiliates in 90th-95th uncertain political environments have a positive semi-elasticity. That is, a 10 percentage points decrease in C is associated with total *decrease* in earnings of 0.1% (= -0.647+0.658), as opposed to increase earnings of 6.5% for affiliates in in the reference group. Since the semi-elasticity is quite small, we should not rule out that it may not be statistically different from zero.

Table 6: Political Uncertainty

	(1) Above or Equal: 75th Percentile	(2) Above or Equal: 90th Percentile	(3) Above or Equal: 95th Percentile	(4) Pre-Defined Categories
C	-0.646***	-0.619***	-0.576***	-0.647***
	(0.086)	(0.084)	(0.083)	(0.086)
ΔPV Percentile	0.002	0.005	-0.025***	
	(0.004)	(0.006)	(0.008)	
ΔPV Percentile x C	0.254***	0.382***	-0.072	
	(0.072)	(0.097)	(0.144)	
Category 1 (75 – 90)				-0.000
				(0.005)
Category 1 x C				0.165**
				(0.084)
Category 2 (90 – 95)				0.025***
				(0.008)
Category 2 x C				0.658***
				(0.133)
Category 3 (95)				-0.023***
				(0.009)
Category 3 x C				-0.017
				(0.146)
Observations	463,125	463,125	463,125	463,125
R-squared	0.748	0.748	0.748	0.748
Year Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes

*The table reports the OLS estimation from the panel data, based on Eq. (8). The dependent variable is the log of EBIT. C is the composite tax variable. ΔPV Percentile is a dummy equalling one if the country is in the defined percentile for the regression. Category 1 is a dummy variable that equals 1 if the country´s political uncertainty is in the 75th to 90th percentile. Category 2 is a dummy variable that equals 1 if the country´s political uncertainty is in the 90th to 95th percentile. Category 3 is a dummy variable that equals 1 if the country´s political uncertainty is above or equal to the 95th percentile. In regression 1-3 we differ between companies located in, respectively, the 75th, 90th and 95th percentile of political uncertainty. In regression 4 we include the aforementioned categories and interact each with the C-measure. Standard errors clustered at the group level are reported in the parenthesis. ***, **, * respectively denotes significance level of 1, 5 and 10%.*

However, these findings are interesting considering the non-linearity we observed in Section 5.2 for a couple of reasons. Firstly, the aforementioned percentile is equivalent to an average increase of approximately 8% to 11% from previous year in our sample. Analogously, these changes in political risk are most prevailing with a GDP per capita level around 40,000-50,000 in Figure 5 from Section 6.1, which could possibly explain the concavity in the non-linear plot from Figure 2. To be specific, this range reconcile with a median value of GDP per capita of approximately 37,000. Hence, positive relationship between EBIT and the taxes could possibly be caused by the fact that these countries on average faces higher political uncertainty.

The positive relationship is feasible because in our sample less risky countries set on average a higher tax rate (see Appendix C7), which could create an incentive to shift to higher taxed countries that are less risky. Moreover, our prediction states that affiliates in uncertain political environments should be less able to set abusive transfer prices because the predictability of earnings is less feasible, and thus run the risk of jeopardizing the overall minimization strategy of the global tax bill. In our sample, the affiliates operating in the 90^{th}-95^{th} percentile of uncertainty, have a mean value of the C-measure which is positive. That is, on average, these have an incentive to shift profits out of the country (in optimum). But conflictedly, they also report quite high EBIT compared to the rest of our sample (see Appendix C8). There could be many reasons for this, such as better investments opportunities in these countries (e.g., higher overall development) which could potentially trigger an incentive to reinvest earnings which would then alter the shifting incentive. However, our prediction seems more precise; because these affiliates are exposed to more uncertainties ex ante, they still report higher earnings in this particular country as opposed to what they would do optimally based on the tax rate differential. Put differently, the risk motive could potentially dominate the tax motive, for these affiliates.

For example, a decrease in *C* caused by the host country reduces the tax rate (all else equal in Eq. (6)), implies that affiliates in the reference group in the regression table above, would increase earnings. However, this is not the case for affiliates in the 90th-95th percentile, as they would *decrease* earnings. That is, the incentive to report higher earnings in the host country does not compensate for uncertainty these affiliates face. Since the incentive is reversed, it could for example imply that optimal inward shifting is not preferable due to a potentially higher likelihood of severe expropriation and thus seek safer placement of profits. Reverse the logic, the host country increases the tax rate, then we would expect a slightly increase in earnings because the uncertainty makes the prediction less feasible and thus increases the probability of jeopardizing the minimization strategy by abusive outward profit shifting. Hence, the risk caused by uncertainty dominates the tax incentive.[22]

It is further interesting to see that this relationship is not present for the very most uncertain environments (above 95th percentile). They obtain a negative semi-elasticity similar to the reference group, which contradicts our predictions. A possible explanation for this, is that this percentile is primarily dominated by less developed countries where the changes are driven by extreme year-to-year increases in political risk (cf. Figure 5 left) as opposed to large increases *on average*, such as the 90th-95th percentile are exposed to (cf. Figure 5 right). Thus, yearly shocks to the uncertainty could potentially trigger a short-term incentive to shift profits away

[22] Given the political risk level in these percentiles, it could also be that the changes in the tax rates could indicate the direction of the overall risk. For example, a decrease in the tax rate in the host country could potentially signal alternative methods to increase government revenue like confiscatory taxation, while higher tax rates may signal less expropriation. Respectively, these two scenarios may be reflected in outward shifting and inward shifting incentives.

from this country due to higher expected uncertainty in the future or higher likelihood of severe forms of expropriation, which may imply higher tax sensitivity.[23]

On the other hand, it could be that affiliates in these environments prefer the institutional volatility. Although we are only examining the large increases in political risk, Figure 5 (left) shows that the lowest levels of development, involve more countries with extreme year-to-year increases in political risk, but also dominate in the year-to-year decreases in political risk relative to all other countries. Since the average political risk *level* is higher in these countries (see Appendix C8), it could be that the political volatility in the riskiest countries actually benefit MNEs, as the risk might more likely decrease as opposed to increase. Similarly, for 90^{th}-95^{th} percentile of increase in political risk, the overall risk is *less* severe *on average*, thus the outcome of the volatility could potentially go in either direction, leaving the outcome ambiguous. This goes against the expropriation argument of protecting profits, and thus implies that because the most likely scenario might be lower political risk, the predictability of future earnings may be higher and thus increase the tax sensitivity.

Hence, the underlying cause of the unexpected increase in the tax sensitivity for the most uncertain political environment is ambiguous. Nevertheless, the non-linearity models suggest the least developed countries indeed have a negative semi-elasticity. Because the most uncertain environments are predominately centred in the least developed countries, these affiliates face a semi-elasticity not statistically different from the reference group which is still negative. That is, the relatively higher tax sensitivity for the most uncertain environment is reasonable based on an approximation between Figure 2 and Figure 5.

Lastly, the uncertainty could potentially also explain why we see the highest semi-elasticity in the lower-middle of the distribution of development. Although not explicitly shown in the regression table, Figure 5 showed that countries in the range of 20,000-40,000 experience the lowest political volatility, which most likely are incorporated in the reference group carried out in the regression. According to our prediction, lower institutional volatility should increase

[23] We refer to this as the expropriation argument which assumes that in lower political risk environments, less severe forms of expropriation increase the probability of loss. This could give rise to a potential non-positive tax rate (Klassen, Lang and Wolfson, 1993), and in turn, an incentive to shift profits inward, reflected in lower sensitivity. However, at higher levels of political risk, it might emerge an incentive to protect profits because the consequences are too severe (higher sensitivity). By running a quadratic interaction model on the latter, we find support of this argument. Reported in Appendix B1. Kesternich and Schnitzer (2010) applies similar intuition in terms of which form of expropriation is more prevailing depending on the overall level of political risk.

the tax sensitivity, which could help explaining why development in the range of 20,000-30,000 faces the highest semi-elasticity.

6.3 Corruption in the Tax Administration

The specifications presented in Table 7, tests if corruption in the tax administration reduces the concealment costs of multinationals' profits shifting activities, and thus increases the tax sensitivity. Recall, too much corruption, could potentially reduce the tax sensitivity as the marginal tax rate increases with non-tax related corruption. We proceed with the same approach as above where *Percentile* is now a dummy variable indicating whether the affiliate is located in a country with a corruption rating above the percentile.

The interaction term in column (1), is significant at the 1% level and negative. The semi-elasticity for affiliates with a corruption level below the 25^{th} percentile is not statistically different from zero. Affiliates above the latter, however, have a semi-elasticity of an additional -0.75 on average. Similarly, column (2) suggests an additional semi-elasticity of -0.96 compared to the *lower* 50^{th} percentile. All else equal, this suggests that affiliates in more corrupt environments respond to a change in the tax incentive to a greater extent than affiliates in less corrupt environments. However, in the 75^{th} percentile, the relationship changes, and we cannot say if affiliates above the 75^{th} percentile faces a different semi-elasticity than affiliates below the 75^{th}. Interestingly, column (4) shows that affiliates operating in countries in the *lower* 90^{th} percentile of corruption, on average, have a semi-elasticity of -0.5. However, affiliates in very corrupt countries (top 10^{th}) have a semi-elasticity of -1 on average. That is, the point estimate suggests an average response for affiliates in the upper distribution of corrupt countries are twice the size of all other affiliates.

To disentangle the response between these groups, we restrict the percentiles as in Table 6. By contrast, we are now interested in lower levels of corruption as well as testing whether highly corrupt countries may be related to additional non-tax related bribes which are expected to increase the marginal tax rate of the affiliate. Hence, specification (5) divides the sample into firms operating in the following percentiles: 30^{th}-50^{th} (*Category 1*), 50^{th}-75^{th} (*Category 2*), 75^{th}-99^{th} (*Category 3*) and above 99^{th} (*Category 4*). The reference group is affiliates in countries where the corruption level is below the 30^{th} percentile in our sample.

Table 7: Corruption in the Tax Administration

	(1) Above: 25th Percentile	(2) Above or Equal: 50th Percentile	(3) Above or Equal: 75th Percentile	(4) Above or Equal: 90th Percentile	(5) Pre-Defined Categories
C	-0.027	-0.120	-0.630***	-0.514***	0.041
	(0.136)	(0.105)	(0.096)	(0.087)	(0.133)
CC Percentile	0.058***	0.011	0.035***	-0.041***	
	(0.018)	(0.012)	(0.011)	(0.013)	
CC Perc. x C	-0.747***	-0.955***	0.171	-0.495***	
	(0.143)	(0.136)	(0.142)	(0.164)	
Category 1 (30 – 50)					0.050
					(0.036)
Category 1x C					-0.413**
					(0.171)
Category 2 (50 – 75)					0.041**
					(0.020)
Category 2 x C					-1.983***
					(0.182)
Category 3 (75 – 99)					0.080***
					(0.023)
Category 3 x C					-0.455***
					(0.178)
Category 4 (99)					-0.039
					(0.071)
Category 4 x C					-3.690***
					(0.806)
Observations	463,125	463,125	463,125	463,125	463,125
R-squared	0.748	0.748	0.748	0.748	0.748
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes	Yes

*The table reports the OLS estimation from the panel data, based on Eq. (8). The dependent variable is the log of EBIT. C is the composite tax variable. CC Percentile is a dummy variable equalling 1 if the country is in the defined percentile for the regression. Category 1 is a dummy variable that equals 1 if the country´s control of corruption level is in the 30th to 50th percentile. Category 2 is a dummy variable that equals 1 if the country´s control of corruption level is in the 50th to 75th percentile. Category 3 is a dummy variable that equals 1 if the country´s control of corruption level is in the 75th to 99th percentile. Category 4 is a dummy variable that equals 1 if the country´s control of corruption level is above or equal to the 99th percentile. In regression 1-4 we differ between companies located in, respectively, the 25th, 50th, 75th and 90th percentile of corrupt environments. In regression 5 we include the aforementioned categories and interact each with the C-measure. Standard errors clustered at the group level are reported in the parenthesis. ***, **, * respectively denotes significance level of 1, 5 and 10%.*

In column (5) we are not able to conclude that the semi-elasticity is statistically different from zero for the reference group. Affiliates in the 30th-50th percentile (*Category 1*) are expected on average to change earnings by an additional 4% relative to the reference group. Increasing the risk level to the 50th-75th percentile (*Category 2),* the model suggests affiliates becomes highly tax sensitive. Specifically, *Category 2* are on average expected to change earnings by an additional 19.8% compared to the reference group. Interestingly, the coefficient on the conditional relationship in 75th-99th percentile (*Category 3*) of corrupt countries suggests a slightly less increase in the tax sensitivity than the latter. That is, an additional change in reported profits of 4.6% relative to the reference group. According to our expectation, this could potentially imply that the cost of profit shifting for these affiliates is too severe due to non-tax related bribes. However, this might be inconclusive because affiliates in the most corrupt countries (99th) displays a significant increase in the tax sensitivity of additional -3.7, on average.

To summarize, the specifications reveal that corruption increases the tax sensitivity in all specifications, but at different magnitude. Marginal increases in corruption, that is, from the reference group to Category 1, increases the tax sensitivity, while moving to corruption level in the upper-middle (Category 2) increases the sensitivity substantially, and to Category 3 suggests a lower increase than the latter. A possible explication is that lower level of corruption may only be influential for smaller transactions, while higher levels allow for increased opportunities to circumvent regulations. Interestingly, we see that the largest increase in the semi-elasticity occurs in the range of 50^{th}-75^{th} percentile. The mean of GDP per capita for this group is roughly 23,000. Recall from the non-linearity plot that the minimum point of the curve is approximately around 20,000-30,000 (lower-middle of development). Thus, a possible explanation for the relatively high tax sensitivity, is that this corruption level facilitates circumvention of existing regulations and thus spur the shifting incentive, in accordance with our prediction.

Further, according to our model, the tax sensitivity decreases after the 75^{th} percentile relative to the 50^{th}-75^{th} , which translates to a mean GDP per capita of approximately 11,000 for the 75^{th}-99^{th} percentile of corruption. That is, these levels of corruption reconcile with lower development and could possibly explain why we see the least developed countries faces a lower tax sensitivity than the lower-middle. That is, according to our predictions, the non-tax related bribes might be more prevailing at these levels and would thus decrease the tax sensitivity as the marginal bribe rate may potentially be higher than the marginal tax rate of the affiliate.

A possible caution should be directed to the 99^{th} percentile as these affiliates faces a substantially higher tax sensitivity again. An alternative explanation could be that extreme corruption allows for large scale of profit shifting and the non-tax related bribes is thus insignificant for the MNEs operating in these environments. On the other hand, it could also be that multination’s want to protect its profits from corruption outside the tax administration. If this is the case, then there is an incentive to shift profits out of the country and we might observe a higher tax sensitivity. Since corruption is positively related to political risk, it could be that the expropriation argument may trigger the result. Nevertheless, the number of observations in this range is small and could potentially be driven by outliers, thus some caution should be exercised.

6.4 Compliance Costs

In Table 8 we test whether regulatory burden and inefficiencies imposed on MNEs by the tax authorities, increases the compliance costs and thus reduces the tax sensitivity. We follow the structure from previous tables, where *Percentile* is a dummy variable indicating whether the affiliate is located in a country where the compliance costs is above the percentile of interest.

The interaction term in column (1) suggests that affiliates operating in countries where the compliance costs is above the 25th percentile, have a higher tax sensitivity compared to affiliates below 25th percentile. Affiliates above the 50th percentile, show a lower sensitivity relative to affiliates below the 50th percentile. Similar trend for specification (3) and (4). For example, a 10-percentage point change in the tax incentive for affiliates in countries where burden to comply with tax payments are very high (above the 90th percentile) would change reported earnings by only 2% (= -0.635+0.441) on average. By contrast, affiliates in the *lower* 90th percentile would respond to the same incentive by changing earnings by approximately 6.4% on average. The results suggest that affiliates located in countries where the regulatory burden in terms of tax compliance is high, have a lower tax sensitivity on average, in accordance with our prediction.

Specification (5) disentangle the responsiveness to the tax incentive by categorizing countries based on low compliance costs in 10th-30th percentile, 30th-50th percentile, 50th-75th percentile and above 75th percentile. The reference group is below 10th percentile.

When separating the responsiveness based on these groups, the model suggests that compliance costs in the range of 30th-50th percentile increases the sensitivity compared to the tax systems imposing the least regulatory burden for firms. In fact, it increases the semi-elasticity of an additional -1.13 relative to the reference group. Interestingly, affiliates located in countries where the compliance costs are higher do not seem to respond differently to the tax incentive relative to the reference group. That is, our model suggests that affiliates operating in countries where the burden to comply with taxes are above the mean in our sample, are not statistically different from countries where the burden to comply is lowest. Importantly, the semi-elasticity of the reference group is not statistically different from zero.

Table 8: Compliance Costs

	(1) Above: 25th Percentile	(2) Above or Equal: 50th Percentile	(3) Above or Equal: 75th Percentile	(4) Above or Equal: 90th Percentile	(5) Pre-Defined Categories
C	-0.253*	-0.709***	-0.650***	-0.635***	-0.236
	(0.142)	(0.106)	(0.091)	(0.087)	(0.208)
PT Percentile	0.016*	-0.060***	-0.048***	-0.037***	
	(0.009)	(0.007)	(0.008)	(0.009)	
PT Perc. x C	-0.429***	0.232**	0.279**	0.441***	
	(0.145)	(0.112)	(0.112)	(0.139)	
Category 1 (10 – 30)					0.008
					(0.013)
Category 1 x C					-0.146
					(0.215)
Category 2 (30 – 50)					0.004
					(0.016)
Category 2 x C					-1.130***
					(0.234)
Category 3 (50 – 75)					-0.043***
					(0.016)
Category 3 x C					-0.353
					(0.231)
Category 4 (75)					-0.070***
					(0.018)
Category 4 x C					-0.155
					(0.230)
Observations	463,125	463,125	463,125	463,125	463,125
R-squared	0.748	0.748	0.748	0.748	0.748
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes	Yes

*The table reports the OLS estimation from the panel data, based on Eq. (8). The dependent variable is the log of EBIT. C is the composite tax variable. PT Percentile is a dummy variable equalling one if the country is in the defined percentile for the regression. Category 1 is a dummy variable that equals 1 if the country´s paying taxes score is in the 10th to 30th percentile. Category 2 is a dummy variable that equals 1 if the country´s paying taxes score is in the 30th to 50th percentile. Category 3 is a dummy variable that equals 1 if the country´s paying taxes score is in the 50th to 75th percentile. Category 4 is a dummy variable that equals 1 if the country´s paying taxes score is in above or equal to the 75th percentile. In regression 1-4 we differ between companies located in, respectively, the 25th, 50th, 75th and 90th percentile of corrupt environments. In regression 5 we include the aforementioned categories and interact each with the C-measure. Standard errors clustered at the group level are reported in the parenthesis. ***, **, * respectively denotes significance level of 1, 5 and 10%.*

To sum up, the first specifications suggests that there is somewhat lower tax sensitivity in countries with higher complexity in the tax systems. However, as specification (5) reveals, we are not able to separate the responsiveness between affiliates exposed to compliance costs above the mean of our sample and affiliates in countries with the lowest compliance costs. Although the model suggests that affiliates where the regulatory burden to comply with taxes is insensitive to the tax differential, the same holds for the lowest regulatory burden. That is, the compliance costs cannot solely explain the insensitivity. However, it could possibly explain why the very least developed countries faces a lower tax sensitivity relative to the lower-middle. In our sample, the least developed countries are also the least developed in terms of tax system based on our proxy (see Appendix C9). Thus, affiliates in countries where the compliance costs are high, face a semi-elasticity that is not statistically different from zero, which can be a direct consequence of costs associated with shifting profits. This raises a potential question if the higher compliance costs, or complexity of the system, are strategically set to reduce the tax sensitivity and thus increase the effect of rising the tax rate in terms of collecting government revenue.

Summarizing the potential explanation for the non-linearities

Our findings indicate that the very least developed countries face a higher tax sensitivity relative to the lower-middle of development (minimum point in the non-linear plot) potentially due to higher concealments costs. That is, the least developed countries have on average the highest score in terms of compliance costs related to the tax system based on our proxy. According to our prediction, this may entail higher compliance costs for MNEs which ultimately yields a smaller semi-elasticity than the lower-middle of development. In addition, we find that in the least developed countries, the corruption level might be too severe and thus possibly imply non-tax related bribes which decreases the semi-elasticity relative to the lower-middle of development. A third explanation could be that the political uncertainty becomes larger on both sides of the minimum point from the non-linearity plot, thus reflected in lower sensitivity as the predictability of future earnings is less feasible relative to affiliates in the minimum point.

Further, our findings suggest that corruption may be an important explanation for why the lower-middle of development faces the highest tax sensitivity relative to all other levels of development. The regression carried out on corruption, suggests the largest increase in the semi-elasticity occurs in the range of 50^{th}-75^{th} percentile, which roughly reconciles with the minimum point in the non-linearity plot. Thus, corruption at this level, according to our reasoning, could facilitate profit shifting in a larger degree (i.e., marginal tax rate is larger than the marginal bribe rate). In addition, the minimum point on the non-linear curve also reconciles with countries that on average face lower political uncertainty. Thus, an alternative explanation is that lower institutional volatility increases the tax sensitivity as the predictability serves as a facilitator to more aggressive transfer prices.

Lastly, we purpose a potential explanation for the counterintuitive positive semi-elasticity for the upper-middle of development, related to political uncertainty. The risk caused by political uncertainty could potentially dominate the tax incentive for affiliates in the upper-middle of development, because the average uncertainty is too severe and MNEs would not risk jeopardizing the overall minimization strategy by setting abusive outward or inward transfer prices.

7. Robustness

In this section we will perform several robustness tests to investigate whether our empirical results are valid. Our focus is centred on the credibility of our panel estimation as a replication of various robustness tests for the cross-sectional model has been performed in accordance with the methodology of Huizinga and Laeven (2008). Specifically, we find that the semi-elasticity of profits with respect to the tax incentive remains negative and significant in all specification (See Appendix A3 for full robustness table).[24] Moreover, the subsequent robustness tests will mainly rely on similar tests performed by Huizinga and Laeven (2008). Firstly, we will primarily consider validity of our results with respect to development in terms of proxies applied, as well as skewness due to sample restrictions. Secondly, we test whether our country risk explanations are sensitive to sample restrictions and proxies to rule out potential alternative explanations for our findings.

7.1 Tax Senstivity and The Role of Development

Specification (1) in Table 9 tests the sensitivity in regard to the dependent variable (EBIT). That is, we substitute the dependent variable with the log of EBT and regress it on the same input factors and the tax incentive, *C*. Comparing the results to specification (3) in Table 4, we obtain a higher semi-elasticity of reported profits of approximately -1. This is in line with meta study of Heckemeyer and Oversech (2017) that showed the effect of semi-elasticity of pre-tax profits was larger than the semi-elasticity of EBIT. The reason is that when analysing the total pre-tax profits, we incorporate all possible profit shifting channels, while utilizing earnings before interests excludes the intra-company financing route. Hence, the result from utilizing a different measure of the dependent variable is as expected, and the subsequent specifications is carried out utilizing EBIT as dependent variable.

Since the tax measure used in this thesis are of crucial importance with respect to analysing profits shifting, we find it natural to examine the validity by applying different proxies. Respectively, the tax measure in column (2-3) is a capital weighted (as opposed to sales

[24] In column (13) in Appendix A3 we obtain a positive semi-elasticity when utilize log of interest expenses as dependent variable. However, this is in line with Huizinga and Laeven (2008), which imply that the interest expenses are positively related to the tax rate differential.

weighted) C-measure and C-vis-à-vis-subsidiaries (excluding parent companies). In specification (4), we address concerns raised in Section 3.3 and Section 4.3 of the exposure to measurement error due to data availability of all subsidiaries within an MNE. That is, we include a simple tax rate differential between the affiliate and its parent company. In all specifications, the tax incentive drops somewhat but remains negative and statistically significant at the 1% level. Worth noting, the C-vis-à-vis-subsidiaries enters the regression with a larger negative coefficient than the tax rate differential to the parent. This could potentially indicate that larger tax rate differentials between related subsidiaries are more important than larger differentials directly to its parent.

The specifications presented in column (5-11) in Table 9, investigates whether our findings with respect to development and tax sensitivity is robust. In column (5) we examine whether the amount of total subsidiaries for each MNE, after restriction, affect the tax sensitivity. That is, we restrict the sample to only include multinational groups where we have at least 50% of all subsidiaries in our sample, as opposed to the baseline model of 20%. Better representation of accounting data on all affiliates in our sample should increase the precision of the tax incentive. The results suggest a slightly lower semi-elasticity for lower-income countries. However, consistent with previous result, the interaction term with the C-measure and the high-income dummy, represented by the 75th percentile of GDP per capita, is positive and statistically significant. The results suggest a possible upward bias for the less developed countries where the data restriction is laxer.

Moreover, it would be interesting to see if our results were driven by MNEs which operate in similar developed countries. That is, MNEs that do not operate in countries with very different level of development. Hence, we restrict the sample to only include MNEs that, after all restrictions, have at least two foreign national subsidiaries (i.e., three operational locations including parent company). In column (6) the C-measure is still negative and statistically significant and the interaction with the simple high-income dummy suggests a positive coefficient in accordance with previous models. However, the interaction effect is insignificant, and we cannot say if MNEs in the upper distribution of GDP per capita in our sample are statistically different from lower-income countries. Carrying out the same regression but substituting the C-measure with C-vis-à-vis-subsidiaries in column (7), we obtain qualitative similar results as our baseline model. A possible explication for this could be that larger MNEs conduct less transfer pricing transaction directly to its parent company which is consistent with the results from column (3) and (4). If this is the case, then incorporating the parent in the construction of the tax incentive could be misleading and may lead to a biased estimate. This could explain the insignificant results from column (5). Recall, the median MNE in our sample only have one foreign national subsidiary. Hence, we cannot rule out that our results are driven by MNEs operating in similar level of development.

Although we believe GDP per capita reflect development in a good way, it would be interesting to see if the results are sensitive to the development measure applied in this thesis. In column (8-9) we use credit-to-GDP and an average of the WGI sub-indices (government effectiveness, regulatory quality and rule of law), as a proxy for development. Indeed, the semi-elasticity is statistically significant and suggests development is negatively related to the tax sensitivity.

Considering the results of Johannesen et al. (2019) we, in column (10-11), utilize the GNI per capita provided by the WB. Firstly, in accordance with our previous specifications, we separate the response based on the 75th percentile in our sample in column (10). The model suggests an average semi-elasticity for lower-income countries of -0.74 and -0.16 for high-income countries which reconciles with the results from Table 4 column (4). Further, in column (11), we separate high-income countries by the WB´s classification of high-income countries by GNI per capita.[25] Qualitatively, we obtain the same results, except the interaction with the high-income dummy is insignificant. The reason is that according to the WB´s classification, the high-income countries by this definition in our sample accounts for approximately 78% of our sample, compared to the previous specification of 75th percentile. This highlight that our sample are primarily dominated with high-income countries by the WB´s classification. Nevertheless, the objective in this thesis has not been to explicitly categorize countries into developing, emerging and developed countries as this might be dismissive depending on the years we analyse, and as our results indicate, the relationship might be more nuanced.

As explained in Section 3.2, we believe the most appropriate approach in this thesis has been to measure the different effects utilizing the variation at country level. However, it would be interesting to see if we are able to draw similar conclusion utilizing within effects. Hence, to

---

[25] High-income countries are classified by GNI per capita above or equal to 12,475 and 12,376 respectively for 2011 and 2019 (Prydz and Wadhwa, 2019). We use an average of the two.

further check the robustness of our model we include a set of group fixed effect similar to Barrios and d´Andria (2019).[26] That is, column (12) test whether within-group variation affects the relationship between reported earnings and the composite tax measure, as well as the role of development. Including these factors serves as a control for both size and complexity of the MNE. As explained by Barrios and d´Andria (2019) the complexity and size of the group are expected to have different productivity and capability related to profit shifting behaviour. In addition, column (13) accounts for affiliate fixed effects to evaluate if we observe similar effects utilizing a fixed effect model.

When controlling for group or affiliate fixed effects, the semi-elasticity is still negative. In both specifications, the semi-elasticity for the lower 75th percentile of GDP per capita is statistically significant at 5% level and has decreased in scale to approximately -0.17 and -0.20 respectively for group fixed effects and affiliates fixed effects. However, the interaction term with the high-income dummy is statistically insignificant. Comparing the results to column (6-7), a possible explanation could be that the within group or within firm variation is rather small as the semi-elasticity of profits, when these fixed effects are excluded, are larger.

Overall, our preferred model is somewhat sensitive to the tax measured used, as expected, but remains qualitatively consistent in all specifications. Moreover, in our sample, the role of development seems quite robust. Affiliates operating in the upper distribution of our sample faces a lower tax sensitivity compared to the lower distribution in most specifications. However, applying the WB´s criteria for high-income economies in our sample, do not show any significant difference. Addressing the concerns raised in the Section 3.3, that our data is biased towards Europe. A possible explanation for the results is that many Eastern European countries have experienced quite significant economic progress the recent years, thus implying we are primarily evaluating the effect of development between relatively developed countries.

To evaluate the robustness of the non-linear relationship between development and tax sensitivity, we investigate whether the relationship is sensitive to development measure applied (reported in Appendix B2 and B3). Proxying financial development by credit-to-GDP

[26] Specifically, we account for number of countries the MNE is active in, number of subsidiaries within the group, consolidated EBIT, consolidated net-financials (difference between consolidated EBIT and EBT) and consolidated intangible assets (difference between total assets and fixed assets). The consolidated data is obtained by summing all of the aforementioned accounting data for each MNE.

we obtain remarkably similar results. In addition, we perform the same regressions with the original proxy, but restrict the sample to only include firms for which we have at least 50% of subsidiaries in the sample (reported in Appendix B4 and B5). The polynomial interaction regression of the highest order yielded qualitatively similar result, enhancing our confidence of a non-linear relationship. Worth noting, the latter did not display a statistically significant counterintuitive positive semi-elasticity. Hence, we cannot rule out that the positive semi-elasticity is sensitive to possible skewness in our sample selection.

Nonetheless, our results coincide with our previous models and thus alleviates credibility concerns in regard to the tax incentive measure and the development indicator applied or possible skewness in the data sample. Lastly, we find that our results related to the non-linearities remain qualitatively similar. That is, lower-middle of development faces the highest tax sensitivity, least developed countries face a lower tax sensitivity relative to the lower-middle, while the effect of tax rate differentials are essentially absent for the upper-middle of development.

Table 9: Robustness of Tax Sensitivity and Development

	Tax Incentive				Development								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	EBT C-Measure	Capital Weighted C	Vis-à-vis Sub	Vis-à-vis Parent	50% of Affiliates C-Measure	Big Firms C-Measure	Big firms	Financial Development C-measure	Governance Development	GNI 75^{th} percentile	High Income by WB	Group FE High income	Firm FE High income
Labour	0.469***	0.484***	0.485***	0.485***	0.433***	0.561***	0.561***	0.486***	0.485***	0.485***	0.485***	0.459***	0.307***
	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)	(0.008)	(0.008)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)
Capital	0.320***	0.299***	0.299***	0.299***	0.296***	0.261***	0.261***	0.299***	0.299***	0.299***	0.299***	0.308***	0.114***
	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)	(0.005)	(0.005)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Development	0.224***	0.200***	0.194***	0.198***	0.361***	-0.065	-0.067	-0.142***	-0.009***	-0.008***	-0.007***	-0.108***	0.172***
	(0.039)	(0.036)	(0.036)	(0.036)	(0.048)	(0.056)	(0.056)	(0.030)	(0.002)	(0.002)	(0.002)	(0.006)	(0.033)
Tax Incentive	-0.957***	-0.136***	-0.586***	-0.448***	-0.641***	-0.319**	-0.298**	-0.709***	-0.775***	-0.735***	-0.604***	-0.171**	-0.196**
	(0.100)	(0.016)	(0.092)	(0.061)	(0.172)	(0.130)	(0.142)	(0.089)	(0.090)	(0.090)	(0.141)	(0.073)	(0.077)
High Income					-0.008	-0.001	-0.004	0.036**	-0.007	-0.040***	0.030	0.280***	0.023***
					(0.015)	(0.011)	(0.011)	(0.016)	(0.024)	(0.011)	(0.031)	(0.010)	(0.006)
High Inc. x Tax In.					0.666***	0.248	0.379**	0.609***	0.801***	0.575***	0.037	0.079	0.080
					(0.259)	(0.157)	(0.174)	(0.150)	(0.154)	(0.136)	(0.159)	(0.128)	(0.084)
Log GNI										0.187***	0.152***		
										(0.042)	(0.042)		
Observations	424,610	462,167	462,734	464,596	285,886	168,642	168,642	457,480	462,734	462,734	462,734	462,383	462,734
R-squared	0.732	0.745	0.748	0.747	0.664	0.733	0.733	0.745	0.748	0.748	0.748	0.743	0.072
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Group or Firm FE												Yes	Yes

*The table reports the OLS estimation from the panel data, based on Eq. (8). The dependent variable is the log of EBIT in all regressions except regression 1. Capital is the log of fixed assets. Labour is the log of total cost of employees. Development is the indicator of the overall development in a country. Tax incentive is tax measure carried out in the regression. High Income is a dummy variable that equals 1 if the affiliate is located in a country that is in the 75^{th} percentile of the Development indicator. Log GNI is the log of gross national income only carried out in regression 10-11. All the regressions includes both year and industry fixed effects. Country fixed effects are included in all regressions except regression 12. Group or firm fixed effects are included in regression 12 and 13. Regression 1 is substituting the log of EBIT as the dependent variable with the log of EBT. The Tax Incentive in regression 2 is a capital weighted C-measure. The Tax Incentive in regression 3 is the original C-measure excluding parent. The Tax Incentive in regression 4 is a tax differential between the affiliate and the parent. Regression 5 restricts the sample to only MNEs where we have 50%, or more, of the subsidiaries left in the sample. Regression 6 restricts the sample to only MNEs with at least two foreign national affiliates. Regression 7 is carried out on the same sample as regression 6 but the Tax Incentive is C vis-à-vis subsidiaries (same as regression 3). Regression 8 substitutes GDP per capita with credit to GDP. Regression 9 substitutes GDP per capita with the average score of the WGI indices: government effectiveness, regulatory quality and the rule of law. Regression 10 substitutes the GDP per Capita with GNI per capita, categorized on the 75^{th} percentile. Regression 11 also applies GNI per capita but is categorized on GNI per capita is above $12,425. Regression 12 does not include country fixed effects, but accounts for a set of group fixed effects. Regression 13 is a fixed effect model accounting for firm fixed effects. Standard errors clustered at the group level are reported in the parenthesis. ***, **, * respectively denotes significance level of 1, 5 and 10%.*

7.2 Country Risk

To test whether our results related to country-specific risk explanations holds, we first investigate how sample restrictions affect the results, similar to column (5) in Table 9. That is, we consider whether the categorization carried out in the last column in each of Table 6-8 are sensitive to the same sample restriction, which is reported in Appendix B6.[27] Hence, we restrict the sample to include only MNEs where we have at least 50% of all subsidiaries in our sample after all restrictions.

The C-measure for the reference group (least risky) are statistically significant in all specifications, except for affiliates in the lower 30th percentile of corruption, as expected based on previous specifications. Further, the model enhances our confidence that the direction of political uncertainty reduces the tax sensitivity, while in the very most volatile environments the tax sensitivity increases again, in accordance with previous specifications. Worth noting, the 90-95th now displays even a more positive semi-elasticity which supports our findings of a possible inference that the risk motive could be an important consideration. Interestingly, we are now able to differentiate the response between affiliates exposed to the highest compliance costs and the affiliates exposed to the lowest compliance costs, suggesting the regulatory burden reduces the tax sensitivity. That is, the findings still suggest the tax sensitivity for affiliates exposed to the highest compliance costs faces a lower tax sensitivity. Lastly, corruption increases the tax sensitivity from 30th percentile to 75th percentile, the conditional interaction terms for affiliates in the 90th and the 99th percentile suggest a negative sign but are not statistically different from zero. A possible explanation for the latter could be that we have restricted the sample by over half, and thus limiting the cross-sectional variation in corruption. Nevertheless, the model is supportive of the highest levels of corruption reduces the tax sensitivity, which reconcile with our prediction. Overall, the predicted directions are consistent and thus alleviates concerns related to sample selection.

Furthermore, the analysis of country risk explanations has utilized quite narrow measures (where possible) to analyse potential opposing effects of risk on the shifting incentive. Since there are several caveats using indices in general, we find it natural to check whether our

[27] Similar to the regression models in Section 6, the Cobb-Douglas input factors and the productivity measure is still carried out in the regressions but not reported in the table.

results are sensitive to risk measure applied in order to rule out possible alternative explanations. In the subsequent regressions in Table 10, we proceed by applying the same categorical approach as the previous models. Although carried out in the regressions, we do not report the Cobb-Douglas input factors, nor the productivity measure.

Firstly, we address the results from Table 8. The first two specifications presented in Table 10, substitutes the paying tax index by, respectively, the number of tax payments and time to pay taxes. Interestingly, all interaction specifications with the different percentiles are significant and positive. The semi-elasticity for the reference group (less than 10^{th}) are now -1.73 and statistically significant at the 1% level as opposed to not statistically different from zero from Table 8. A possible explanation is that the paying taxes index includes the tax burden as a share of commercial profits. Hence, it could be that the generated profits inflate the index for smaller firms. That is, smaller firms report less profits on average relative to the tax burden, which artificially increases the index value. Utilizing the decomposed measures implies we are effectively neglecting the size effect in the categorization and thus the reference category only considers the system itself as opposed to allowing larger firms with higher earnings to represent the lower category. Put differently, countries with low score on the index may be correlated with the size of profits in this country. Moreover, the semi-elasticity in affiliates operating in countries where the number of tax payments and time to comply with taxes are larger, are statistically different from countries operating in the lower 10^{th} percentile of the aforementioned metrics. A possible explanation could be that our sample consists of smaller MNEs operating in rather few jurisdictions. Thus, the costs associated with compliance would be higher relative to larger firms, which in turn, increases the costs of shifting, driving the result of lower tax sensitivity. These findings could suggest that the regulatory burden of the tax system is most prevalent for small MNEs. Nonetheless, we still find that affiliates exposed to the highest regulatory burden indeed faces a lower semi-elasticity.

To examine the validity of the results from Table 7 we, in specification (3), use the CPI-index as a proxy for corruption in the tax administration. As expected, the results reconcile with Table 7 as the correlation between CPI and the control of corruption index are high (see Appendix C6). Furthermore, column (4) applies the survey from WBES which measures the expected number of gifts in meeting with tax officials. Interestingly, the most direct measure does not coincide with the previous models. In fact, it suggests the opposite signs in most of the percentiles. However, when incorporating the measure, we are effectively removing several observations as the data availability is poor and thus reduces our ability to analyse affiliates' incentive to shift profit. Hence, the conflicting result are reasonably assumed to be explained by very low number of observations compared to the baseline model, and thus resulting in biased estimates.

In Table 6, we found that political uncertainty reduced the tax sensitivity in all specifications except above the 95th percentile. As previously stated, uncertainty caused by political turmoil could be triggered by other underlying factors or correspond to other incentives with respect to the tax sensitivity, which may lead to inconclusive interpretations. Thus, we proxy uncertainty by utilizing the yearly change in control of corruption. If the change in corruption is driven by the actual level of corruption, we would expect similar results as in column (3) or Table 7. That is, an enhancing effect on the tax sensitivity. However, the model suggests that affiliates exposed to an increase in corruption from the previous year in the 90th-95th percentile, experienced a substantially lower tax sensitivity relative to affiliates exposed to an increase in corruption in the *lower* 75th percentile in our sample. This reconcile with the specifications in Table 6 as well as previous literature which provides evidence that the uncertainty may be more important than the actual level of risk itself (cf. Section 2). As opposed to Table 6, we are able to differentiate the response between affiliates exposed to the largest increase in corruption and the reference group. These affiliates face a lower tax sensitivity than the reference group, but higher than to affiliates in the 90th-95th percentile. A possible explanation could be linked to the discussion under Section 6.2, that the outcome of volatility in most corrupt environments, usually is for the better which may increase the predictability and thus facilitate more abusive transfer prices. This reconciles with Figure 3 where the most corrupt environment on average experienced an absolute decrease in corruption from 2011-2018. However, the extreme volatility could potentially also trigger an incentive to shift profits out, similar to the severe expropriation argument. Nevertheless, qualitatively, the results coincide with previous estimations. Worth noting, we do not observe the positive semi-elasticity in the 90th-95th percentile utilizing this measure.

To further enhance our confidence that the uncertainty is caused by institutional risk, we investigate which direction volatile economic conditions affect the semi-elasticity. Specification (6) carry out same approach but utilize changes in GDP. The measure is inverted, so higher percentiles consist of economies that experienced a larger contraction in GDP from previous year. The model suggests that affiliates exposed to a decrease in GDP in the 75th-90th percentile faces a *lower* tax sensitivity than affiliates exposed to a less severe contradiction or increase in GDP. This could imply higher probability of loss, and in turn, an incentive to shift profits inward due to a potential non-positive tax rate. However, affiliates exposed to even larger contradictions in GDP, are associated with larger tax sensitivity, which could be explained by an incentive to shift profits out of the country to protect profits. Nevertheless, the model suggests a very high tax sensitivity of -2.23 (= -0.64-1.588) at this percentile which contradicts previous models utilizing change in institutional risk as a proxy for uncertainty.

Table 10: Robustness of Country Risk

	(1) Number of Payments	(2) Time to Pay	(3) CPI	(4) WBES	(5) Change in Corruption	(6) Economic Uncertainty: Change in GDP	(7) Economic Uncertainty: GDP Volatility
C	-1.727***	-1.503***	-0.010	-2.851***	-0.671***	-0.640***	-0.407***
	(0.142)	(0.156)	(0.131)	(0.295)	(0.085)	(0.085)	(0.087)
Perc 10-30	0.067***	0.064**					
	(0.022)	(0.025)					
Perc 10-30 x C	1.604***	1.775***					
	(0.232)	(0.200)					
Perc 30-50	0.113***	0.112***	0.009	3.226***			
	(0.021)	(0.023)	(0.016)	(0.445)			
Perc 30-50 x C	2.025***	1.638***	-0.405**	1.376***			
	(0.195)	(0.199)	(0.168)	(0.476)			
Perc 50-75	0.098***	-0.022	-0.008	2.818***			
	(0.016)	(0.018)	(0.019)	(0.914)			
Perc 50-75 x C	1.099***	0.772***	-1.496***	1.342***			
	(0.190)	(0.178)	(0.171)	(0.348)			
Perc 75-99	0.068***	0.033*	-0.007	6.477***			
	(0.011)	(0.018)	(0.021)	(1.069)			
Perc 75-99 x C	1.116***	0.575***	-0.502***	2.586***			
	(0.150)	(0.186)	(0.175)	(0.441)			
Perc 99			-0.163*	4.497***			
			(0.090)	(0.934)			
Perc 99 x C			-2.353***	-0.344			
			(0.653)	(1.388)			
Perc 75-90					0.005	-0.028***	0.014**
					(0.005)	(0.006)	(0.006)
Perc 75-90 x C					0.282***	0.760***	-0.293***
					(0.092)	(0.117)	(0.108)
Perc 90-95					-0.007	-0.073***	0.024**
					(0.009)	(0.012)	(0.010)
Perc 90-95 x C					0.545***	-1.588***	-0.356*
					(0.151)	(0.208)	(0.207)
Perc 95					-0.010	-0.029**	-0.058***
					(0.009)	(0.011)	(0.012)
Perc 95 x C					0.429**	0.248	-0.902***
					(0.176)	(0.188)	(0.186)
Observations	462,734	462,734	462,734	25,004	463,125	462,734	462,734
R-squared	0.748	0.748	0.748	0.713	0.748	0.748	0.748
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cobb-D Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*The table reports the OLS estimation from the panel data, based on Eq. (8). The dependent variable is the log of EBIT. C is the composite tax variable. Regression 1 substitutes the paying taxes index with number of tax payments conducted in a year. Regression 2 substitutes the paying taxes index with the total amount of hours used on paying taxes in a year. Regression 3 is substituting the control of corruption index with the CPI index. Regression 4 is substituting the control of corruption index with the WBES survey which measures the expected number of gifts in meeting with tax officials. Regression 5 uses the yearly change in in the control of corruption index. Regression 6 includes the change in GDP, while the yearly standard deviation in the GDP is carried out in regression 7. Standard errors clustered at the group level are reported in the parenthesis. ***, **, * respectively denotes significance level of 1, 5 and 10%.*

Building on the last point, we calculate yearly standard deviation based on quarterly growth in GDP. A priori, the outcome is ambiguous. More volatile economic environments could increase the probability of running a loss, given its nature. Thus, reducing the tax sensitivity, as the inward shifting incentive might be the dominant effect. However, more volatility could potentially also create an incentive to protect profits which, in turn, increases the tax sensitivity. Nevertheless, the results suggest the latter is most prevalent. The tax sensitivity increases in all percentiles and suggests that economic uncertainty may be very different from institutional and political uncertainty. This alleviates some of the concerns and point in the direction that political risk may indeed reduce the tax sensitivity to an extent.

To summarize, most of our country risk explanations holds in terms of the predicted direction, with a few cautions. That is, our predictions are not able to explain the higher tax sensitivity in the most uncertain environments nor the highest corruption level. However, for lower levels of the latter, the overall direction was in line with the predictions. In addition, the analysis of the regulatory burden from Section 6.4 in the main specification, reviled that we were not able to differentiate the responsiveness between the highest and lowest compliance costs, which implies that the regulatory burden may not solely explain the direction of the tax incentive. However, the robustness tests showed that the compliance costs are sensitive to possible skewness in our sample, and proxies applied. Essentially, the latter confirmed our prediction as we were able to differentiate the responsiveness between highest and lowest compliance costs, leaving us ambivalent.

Nevertheless, based on the robustness tests conducted, the explanations for the non-linearities related to the shifting incentives MNEs have depending on the specific risk measure, may hold empirically. It is, however, important to emphasize that the underlying incentives caused by the different risk measures driving our results, may in reality be ambiguous as our predictions are based on our reasoning drawn from previous literature mostly outside the scope of profit shifting. In addition, there might also be other opposing effect that are not controlled for in our regressions.

8. Concluding Remarks

The profit shifting literature has thus far assumed a linear relationship between tax sensitivity and development of a country. The aim of this study is to acquire a more nuanced understanding of the role of development, by investigating whether there are non-linearities in the relationship between tax sensitivity and development. Our investigation approach builds on the work of Huizinga and Laeven (2008), and a replication of their model suggests that the tax sensitivity is in line with their study. Appraising the conventional approach on panel estimation for 2011-2019, shows that there indeed is a negative relationship between tax sensitivity and development. Allowing our model to account for possible non-linearities, the results suggest that the relationship between the tax incentive and development of a country is more nuanced. We find that affiliates operating in the least developed countries face a *lower* tax sensitivity relative to the lower-middle, which are most prone to profit shifting. In addition, affiliates in the upper-middle respond to the tax incentive in the opposite direction, that is, a positive semi-elasticity, which is counterintuitive.

These results have not been found in prior profit shifting studies, and the common explanation for why less developed countries are more exposed to tax avoidance has been that they lack resources and capacity in the tax administration to implement and enforce effective anti-avoidance rules. However, this explanation may not solely explain our findings. Therefore, this study provides alternative explanations related to political uncertainty, corruption in the tax administration and compliance costs.

Firstly, the least developed countries in our sample have on average more complex or underdeveloped tax systems, which ultimately may impose higher compliance costs for the MNEs, driving the sensitivity down relative to the lower-middle of development. Additionally, we find the highest corruption level in the least developed countries, which may increase the likelihood of non-tax related bribes, thus reducing the tax sensitivity. Lastly, the political uncertainty is more severe relative to the lower-middle of development, which according to our predictions, curtails the predictability of future earnings, and in turn, reduces the tax sensitivity.

Further, we find that affiliates in countries with a corruption level in the 50^{th}-75^{th} percentile of our sample are exposed to the largest tax sensitivity, which reconciles with the lower-middle of development. Hence, a possible explanation is that corruption, at this level, facilitate profit shifting to a larger degree (i.e., marginal bribe rate is less than the marginal tax rate). In addition, the lower-middle of development has also experienced substantially lower political turmoil, which could serve as an alternative explanation. That is, stable political environments increase the predictability and facilitate aggressive transfer prices.

Finally, a possible explanation for the counterintuitive results is that the risk motive dominates the tax motive for these affiliates. That is, the political uncertainty for the upper-middle of development is *on average* too severe, which may imply that the optimal strategy of the MNE is not to set abusive outward or inward transfer prices in order not to jeopardize the overall minimization strategy. Put differently, a beneficial change in the tax incentive, is not sufficient to compensate for the risk.

Our findings are solid to a wide range of robustness test, mainly considering possible skewness in the sample restriction as well as alternative proxies, where suitable. Although our findings suggest a non-linear relationship, our study is exposed to limitations which has been subsequently addressed throughout this thesis. Some of these shortcomings have provided us with insights that could potentially benefit future research.

Firstly, our investigation strategy implies that we are only evaluating the profitable distribution of subsidiaries. It would be interesting to see if potential loss shifting strategies may alter the qualitatively interpretation of our results, with especial emphasis on country-risk. Secondly, although we have deviated somewhat from previous profit shifting papers by analysing the effect at the country-level, as opposed to utilize the within variation, the results from the robustness test showed similar sign for high-income countries. However, the effect was insignificant and likely due to small within variation. Thus, it would be interesting to see future research examining the role of development and contemplate the analysis with country-risk effects, applying different methodological strategies with sufficient within variation. In addition, as the data improves, especially outside of Europe, this would allow for a better representation of the tax incentive. Future research examining the role of development in a more flexible way may allow for better understanding of the vulnerability in terms of the development of a country and how MNEs’ tax planning decisions are conducted.

From a policy perspective, a more nuanced understanding of the latter, would be beneficial in order to opt regulations thereafter. The inability to curb profit shifting curtails the ability to collect tax revenue as the effect of rising tax rates diminishes. For instance, our results from the least developed countries, raises a question if compliance costs or complex tax systems are strategically set to increase the effect on state revenues by taxation. Accordingly, if corruption actually benefit MNEs' profit shifting activities, to an extent, then reducing corruption in the tax authorities may be important to reinforce the effect of tax rate increases on states revenue. Purely based on our results, reducing corruption in the upper-middle of corruption may enhance the effect of taxation, while reducing corruption for the most corrupt environments may not yield the same positive effect on taxation, given our prediction of non-tax related bribes (i.e., the costs of shifting already exceed the benefits to an extent for these affiliates).

Moreover, we acknowledge that most of our explanations hinge on predictions based on previous research mostly outside the scope of profit shifting literature, and thus the underlying incentives caused by the different risk measures driving our results, may in reality be ambiguous. For instance, we have not been able to explain the inconclusive results of why the most uncertain political environments faces a higher tax sensitivity, which contradicted our reasoning. Whether this is driven by short-term incentive for outward shifting or higher predictability of profits (if the most likely scenario is lower risk), or other possible explanations, remains unclear. However, most of our reasoning held in terms of the direction of the tax incentive according to our data. Although we believe that we have been able to reconcile the different explanations related to the points on the non-linear curve based on approximation, we acknowledge that our choice of percentiles could possibly have been more directly targeted towards development. That is, by dividing the sample differently, we might have been able to get more precise explanations for the non-linearities.

Nevertheless, the role of development and country risk is an understudied field within profit shifting and as stressed by Johannesen et al. (2019), there is a need for future research to investigate the underlying mechanisms of developing countries' vulnerability. Although we believe our results have contributed by shedding lights on a more flexible way to analyse the role of development and how MNEs may respond to three institutional risks, there is still a need to better understand tax planning decisions. Furthermore, an extension of this thesis could be to analyse the different explanations for the non-linearities simultaneously. This would make it possible to determine which explanation is most prevailing. In addition, because tax planning decisions are determined not only by institutional risk, it would be particularly interesting to expand our analysis by conducting a more indebt economic risk analysis, as well as incorporating financial risk to get a more holistic understanding of how MNEs weigh opposing effects related to tax planning decisions.

References

Abbas, A. & Klemm, A. (2013). A partial race to the bottom: corporate tax developments in emerging and developing economies. *International Tax Public Finance* (2013) 20, pp. 596–617. Retrieved November 24, 2020. https://doi.org/10.1007/s10797-013-9286-8

Barrios, S. & d´Andria, D. (2019). Profit Shifting and Industrial Heterogeneity. CESifo Economic Studies, Vol 66, No. 2, pp. 134-156. Retrieved August 14, 2020. https://doi.org/10.1093/cesifo/ifz006

Belitski, M., Chowdhury, F. & Desai, S. (2016). Taxes, corruption, and entry. *Small Business Economics 47*, pp. 201–216. Retrieved November 1, 2020. https://doi.org/10.1007/s11187-016-9724-y

Bilicka, K., & Seidel, A. (2020). Profit shifting and corruption. *International Tax and Public Finance*. Retrieved August 27, 2020. https://doi.org/10.1007/s10797-020-09596-4

Crivelli, E., De Mooij, R. & Keen, M. (2016). Base Erosion, Profit Shifting and Developing Countries. *Public Finance Analysis,* 72, pp. 268-301. Retrieved August 20, 2020. https://doi.org/10.1628/001522116X14646834385460

De Simone, L., Klassen, K. J. & Seidman, J. K. (2016). Unprofitable Affiliates and Income Shifting Behavior. *The Accounting Review* (2017) 92 (3): 113–136. Retrieved November 1, 2020. https://doi.org/10.2308/accr-51555

Desai, M. A., Foley, C. F., and Hines, J. R. (2004). A multinational perspective on capital structure choice and internal capital markets. *Journal of Finance* 59, pp. 2451-2487. Retrieved October 01, 2020. https://www.jstor.org/stable/3694779

Dharmapala, D. (2014). What Do We Know About Base Erosion and Profit Shifting? A Review of the Empirical Literature. *Fiscal Studies 35*, pp. 421-448. http://dx.doi.org/10.2139/ssrn.2373549

Dhawan, A., Ma, L. & Kim, M. H. (2020). Effect of corporate tax avoidance activities on firm bankruptcy risk. *Journal of Contemporary Accounting and Economics 16*, 100187. Retrieved August 18, 2020. https://doi.org/10.1016/j.jcae.2020.100187

Dischinger, M. (2010). Profit Shifting by Multinationals: Indirect Evidence from European Micro Data. *Department of Economics University of Munich.* Retrieved September 15, 2020. https://doi.org/10.5282/ubm/epub.2029

Dreher, A. & Gassebner, M. (2013). Greasing the wheels? The impact of regulations and corruption on firm entry. *Public Choice* (2013) 155, pp. 413–432. Retrieved September 30, 2020. https://doi.org/10.1007/s11127-011-9871-2

Fisman, R. & Svensson, J. (2007). Are corruption and taxation really harmful to growth? Firm level evidence. *Journal of Development Economics 83*, pp. 63–75. Retrieved September 2, 2020. https://doi.org/10.1016/j.jdeveco.2005.09.009

Fuest, C., Hebous, S. & Riedel, N. (2011). International Debt Shifting and Multinational Firms in Developing Countries. *Economics Letter 113,* pp. 135-138. Retrieved August 25, 2020. https://doi.org/10.1016/j.econlet.2011.06.012

Fuest, C., Hebous, S. & Riedel, N. (2013). International Profit Shifting and Multinational Firms in Developing Countries. *MIT Press*, pp. 145-166. Retrieved August 25, 2020.

Gresik, T. A., Schindler, D. & Scheldrup, G. (2015). Immobilizing corporate income shifting: Should it be safe to strip in the harbor?. *Journal of Public Economics 152*, pp. 68–78. Retrieved June 7, 2020. http://dx.doi.org/10.1016/j.jpubeco.2017.06.001

Heckemeyer, J. & Overesch, M. (2017). Multinationals' profit response to tax differentials: Effect size and shifting channels. *Canadian Journal of Economics*, Vol. 50, No. 4. Retrieved September 15, 2020. https://doi.org/10.1111/caje.12283

Hines, J. R., & Rice, E. M. (1994). Fiscal Paradise: Foreign Tax Havens and American Business. *The Quarterly Journal of Economics*, pp. 149-182. Retrieved September 14, 2020. http://www.jstor.com/stable/2118431

Huizinga, H., & Laeven, L. (2008). International Profit Shifting Within Multinationals: A Multi-Country Perspective. *Journal of Public Economics vol. 92* (5/6), pp. 1164-1182. Retrieved August 27, 2020. https://doi.org/10.1016/j.jpubeco.2007.11.002

Johannesen, N., Tørsløv, T., & Wier, L. (2019). Are Less Developed Countries More Exposed to Multinational Tax Avoidance? Method and Evidence from Micra-Data. *The World*

Bank Economic Review, 00, pp. 1-20. Retrieved August 26, 2020. https://doi.org/10.1093/wber/lhz002

Julio, B. & Yook, Y. (2016). Policy uncertainty, irreversibility, and cross-border flows of capital. *Journal of International Economics 103*, pp. 13–26. Retrieved October 28, 2020. http://dx.doi.org/10.1016/j.jinteco.2016.08.004

Kaufmann, D., Kraay, A. and Mastruzzi, M. (2010). The Worldwide Governance Indicators – Methodology and Analytical Issues. *World Bank Policy Research Working Paper No. 5430*. Retrieved September 24, 2020.

Kesternich, I. & Schnitzer, M. (2010). Who is afraid of political risk? Multinational firms and their choice of capital structure. *Journal of International Economics 82*, pp. 208–218. Retrieved August 26, 2020. https://EconPapers.repec.org/RePEc:eee:inecon:v:82:y:2010:i:2:p:208-218

Klassen, K., Lang, M. & Wolfson, M. (1993). Geographic Income Shifting by Multinational Corporations in Response to Tax Rate Changes. *Journal of Accounting Research*, Vol. 31, Studies on International Accounting, pp. 141-173. Retrieved November 2, 2020. https://www.jstor.org/stable/2491168

Leff, N. H. (1964). Economic Development Through Bureaucratic Corruption. *The American Behavioral Scientist*, 82 (2), pp. 337-341. Retrieved September 12, 2020. https://doi.org/10.1177/000276426400800303

Lohse, T., & Riedel, N. (2013). Do Transfer Pricing Laws Limit International Income Shifting? Evidence from European Multinationals. CESIFO Working Paper No. 4404, Category 1: Public Finance. Retrieved October 31, 2020. https://ssrn.com/abstract=2334651

Lui, F. T. (1985). An Equilibrium Queuing Model of Bribery. *Journal of Political Economy*, 93 (4), pp. 760-781. Retrieved September 22, 2020. https://www.jstor.org/stable/1832136

Malesky, E. J. & Samphantharak, K. (2008). Predictable Corruption and Firm Investment: Evidence from a Natural Experiment and Survey of Cambodian Entrepreneurs.

Quarterly Journal of Political Science, 3: pp. 227–267. Retrieved October 9, 2020. https://doi.org/10.1561/100.00008013

Mardan, M. (2017). Why countries differ in thin capitalization rules: The role of financial development. *European Economic Review 91*, pp. 1–14. Retrieved September 29, 2020. http://dx.doi.org/10.1016/j.euroecorev.2016.09.003

Mardan, M. & Stimmelmayr, M. (2020). Tax competition between developed, emerging, and developing countries – Same same but different?. *Journal of Development Economics 146 102491*. Retrieved September 29, 2020. https://doi.org/10.1016/j.jdeveco.2020.102491

Meon, P. G. & Weill, L. (2010). Is Corruption an Efficient Grease?. *World Development Vol. 38*, No. 3, pp. 244–259. Retrieved September 22, 2020. https://doi.org/10.1016/j.worlddev.2009.06.004

OECD. (2015). Executive Summaries - 2015 Final Reports. *OECD/G20 Base Erosion and Profit Shifting Project.* Retrieved December 1, 2020. www.oecd.org/ctp/beps-reports-2015-executive-summaries.pdf

OECD. (2015). Explanatory Statement. *OECD/G20 Base Erosion and Profit Shifting Project, OECD.* Retrieved September 15, 2020. https://www.oecd.org/ctp/beps-explanatory-statement-2015.pdf

OECD. (2020). Tax Challenges Arising from Digitalisation – Report on Pillar One Blueprint. *OECD/G20 Base Erosion and Profit Shifting Project.* Retrieved December 2, 2020. https://doi.org/10.1787/beba0634-en

Oguttu, A. W. (2016). Tax Base Erosion and Profit Shifting in Africa - Part 1: Africa's Response to the OECD BEPS Action Plan. *ICTD Working Paper 54*. Retrieved December 5, 2020.

Olken, B. A. & Pande, R. (2012). Corruption in Developing Countries. *Annual Revue Economics 4*, pp. 479-509. Retrieved August 31, 2020. https://doi.org/10.1146/annurev-economics-080511-110917

Prydz, E. B. & Wadhwa D. (2019). Classifying countries by income. The World Bank. Retrieved December 11, 2020, from https://datatopics.worldbank.org/world-development-indicators/stories/the-classification-of-countries-by-income.html.

Shleifer A. & Vishny, R. W. (1993). Corruption. *The Quarterly Journal of Economics*, Vol. 108, No. 3., pp. 599-617. Retrieved November 2, 2020. http://links.jstor.org/sici?sici=0033-5533%28199308%29108%3A3%3C599%3AC%3E2.0.CO%3B2-8

Stock, J. H. & Watson, M. M. (2012). Introduction to Econometrics (Third Edition). Edinburg Gate, England: Pearson Education Limited.

Svensson, J. (2003). Who Must Pay Bribes and How Much? Evidence from a Cross Section of Firms. *The Quarterly Journal of Economics*, Vol. 118, No. 1, pp. 207-230. Retrieved September 2, 2020. http://www.jstor.com/stable/25053902

Svensson, J. (2005). Eight Questions about Corruption. *Journal of Economic Perspectives*, 19, pp. 19-42. Retrieved September 21, 2020. https://doi.org/10.1257/089533005774357860

Tax Watch UK. (n.d.). Corporate tax and technology companies – Still Crazy After All These Years. Retrieved December 2, 2020, from https://www.taxwatchuk.org/corporate-tax-and-tech-companies-in-the-uk-2/.

Tørsløv, T. Wier, L. & Zucman, G. (2018). The Missing Profits of Nations. *Nber Working Paper Series*, No. 24701. Retrieved September 12, 2020. http://www.nber.org/papers/w24701

WorldData.info. (n.d.). The most popular tax havens worldwide. Retrieved October 13, 2020, from https://www.worlddata.info/tax-havens.php.

Appendix A – Replication of Huizinga and Laeven (2008)

A 1: Summary Statistics – Europe - 2015

	Obs.	Mean	Std. Dev.	Min	Median	Max
Log EBIT	9,606	6.01	2.54	0.00	5.84	14.45
Log EBT	8,773	5.98	2.67	0.00	5.87	15.29
Capital	9,606	7.19	2.97	0.00	7.23	17.02
Labour	9,606	6.92	2.49	-4.52	6.85	15.27
EMPL	9,606	280.12	1,350.54	0.00	37.00	60,758.00
Leverage	9,606	0.52	0.26	0.00	0.53	1.00
C	9,594	-0.01	0.05	-0.24	0.00	0.28

The table reports the number of observations, mean, standard deviation, minimum, median and maximum for the model variables. The data contain European foreign affiliates for the year of 2015. Log EBIT is the log of earnings before interest and tax. Log EBT is the log of earnings before taxes. Leverage is the affiliates debt-ratio. C is the composite tax variable. Capital is the log of fixed assets. Labour is the log of total cost of employees. EMPL is the number of employees.

A 2: Replication of Huizinga and Laeven (2008) Main Model

	(1)	(2)	(3)	(4)	(5)	(6)
Labour	0.530***	0.528***	0.525***	0.528***	0.509***	0.509***
	(0.012)	(0.013)	(0.013)	(0.013)	(0.015)	(0.015)
Capital	0.335***	0.316***	0.316***	0.316***	0.323***	0.323***
	(0.009)	(0.010)	(0.010)	(0.010)	(0.011)	(0.011)
GDP	-0.017	-0.046*	-0.067*	-0.024	-0.027	-0.006
	(0.025)	(0.025)	(0.035)	(0.027)	(0.029)	(0.032)
C	-1.443***	-1.381***	-1.047***		-1.260***	
	(0.247)	(0.245)	(0.331)		(0.314)	
Eastern Europe			-0.056			
			(0.048)			
Eastern Europe x C			-0.842			
			(0.536)			
C vis-a-vis parent				-0.365*		-0.291
				(0.191)		(0.226)
C vis-a-vis sub				-1.579***		-1.657***
				(0.277)		(0.356)
Obs.	9,594	9,594	9,594	9,594	6,897	6,897
R-squared	0.746	0.756	0.756	0.756	0.757	0.758
Industry Fixed Effects	No	Yes	Yes	Yes	Yes	Yes

*The table reports the OLS estimation from the cross-sectional data, based on Eq. (8), for the year of 2015. The dependent variable is the log of EBIT. Capital is the log of fixed assets, Labour is the log of total cost of employees, Log GDP is the log of GDP per capita and C is the composite tax variable. Eastern Europe is a dummy variable that equals 1 if the country is located in the Eastern Europe. Regression 1 and 2 includes only manufacturing firms in Europe. Regression 1 is does not including industry FE, while regression 2-4 control for industry FE. Regression 3 is the same as regression 2 but is including the dummy for Eastern Europe. Regression 4 includes C vis-à-vis parent and C vis-à-vis subsidiaries, which represents profit shifting incentives vis-à-vis the parent and subsidiaries in foreign countries. Regression 5 and 6 only include MNEs where we have at least 50% of all foreign subsidiaries in the sample after all restrictions. Regression 5 is the same as Regression 2. Regression 6 is the same as Regression 3. Standard errors clustered at the group level are reported in the parenthesis. ***, **, * respectively denotes significance level of 1, 5 and 10%.*

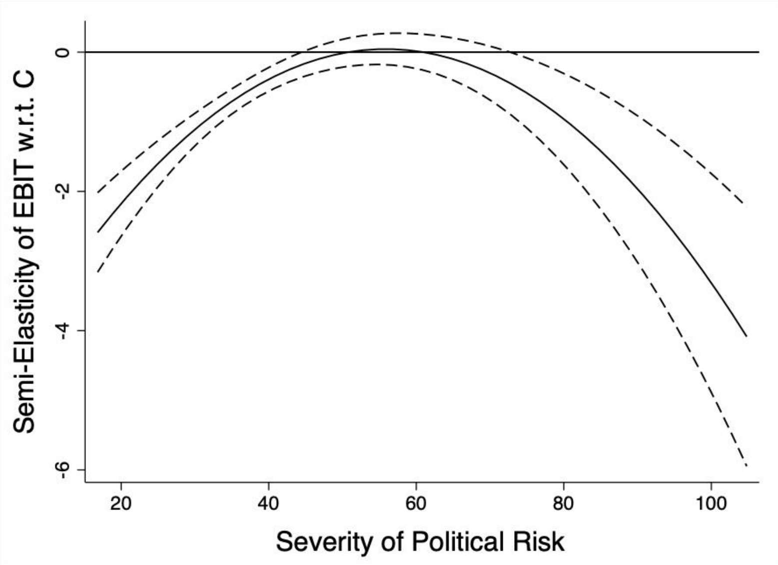
A 3:Replication of Robustness Test Huizinga and Laeven (2008)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Labour	0.531***	0.527***		0.490***	0.522***	0.517***	0.508***	0.525***	0.602***	0.533***	0.392***		
	(0.013)	(0.013)		(0.006)	(0.015)	(0.013)	(0.015)	(0.013)	(0.024)	(0.013)	(0.019)		
Capital	0.318***	0.317***	0.625***	0.296***	0.319***	0.318***	0.321***	0.317***	0.271***	0.317***	0.441***		
	(0.010)	(0.010)	(0.007)	(0.004)	(0.012)	(0.009)	(0.011)	(0.010)	(0.017)	(0.010)	(0.014)		
GDP	-0.038	-0.044*	0.380***	-0.033***	0.069**	-0.003	0.129***	-0.170***	0.119*	0.019	-0.026		
	(0.027)	(0.025)	(0.026)	(0.012)	(0.028)	(0.025)	(0.028)	(0.034)	(0.062)	(0.031)	(0.037)		
EMPL			0.000***										
			(0.000)										
C	-0.696***	-1.146***	-1.848***	-1.218***	-1.442***	-0.983***	-0.953***	-1.141***	-1.085***		0.939**	-5.721***	-5.940***
	(0.226)	(0.228)	(0.280)	(0.133)	(0.288)	(0.242)	(0.279)	(0.250)	(0.330)		(0.399)	(0.448)	(0.506)
Leverage						-1.078***	-1.439***						
						(0.051)	(0.062)						
CPI								-0.008***					
								(0.001)					
CIT i										-1.479***			
										(0.304)			
GDP tot												0.487***	0.521***
												(0.019)	(0.020)
Obs.	9,634	9,634	9,594	40,466	8,761	9,594	8,761	9,594	4,235	9,634	5,726	9,594	8,761
R-squared	0.755	0.756	0.689	0.716	0.717	0.768	0.736	0.757	0.764	0.756	0.691	0.250	0.255
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*The table reports the OLS estimation from the cross-sectional data, based on Eq. (8), for the year of 2015. The dependent variable is the log of EBIT. Capital is the log of fixed assets, Labour is the log of total cost of employees, Log GDP is the log of GDP per capita and C is the composite tax variable. Leverage is the debt-ratio. CPI is the Corruption Perception Index. CTI i is the top statutory tax rate. GDP tot is the log of the GDP. Manufacturing firms are separated from all firms based on the NACE code. Regression 1 includes a C variable calculated on the assumption that B from Eq. (6) equals 1 for all observations (i.e., the cost of profit shifting is unrelated to the scale of operations). Regression 2 includes a C variable calculated on the assumption that B equals total assets. Regression 3 substitutes Labour with the number of employees in the subsidiary. Regression 4 includes all industries. Regression 5 uses the log of earnings before taxes as the dependent variable. Regression 6 controls for leverage. Regression 7 uses the log of earnings before taxes as the dependent variable, as well as controlling for leverage. Regression 8 controls for the CPI index. Regression 9 excludes all firms located in Eastern Europe. Regression 10 substitutes the C-measure with the top statutory tax rate. Regression 11 uses the log of interest expenses as the dependent variable. Regression 12 and 13 only includes the C-measure and the log of GDP. Regression 13 uses the log of earnings before taxes as dependent variable, while regression 12 uses the log of earnings before interest and taxes. Standard errors clustered at the group level are reported in the parenthesis. ***, **, * respectively denotes significance level of 1, 5 and 10%.*

Appendix B – Additional Regressions

B 1: Expropriation Argument



	Quadratic Effect of Political Risk
C	-5.341***
	(0.675)
PV	-0.013***
	(0.002)
PV x C	0.193***
	(0.028)
PV^2	0.000***
	(0.000)
PV^2 x C	-0.002***
	(0.000)
Observations	463,125
R-squared	0.748
Year FE	Yes
Industry FE	Yes
Country FE	Yes
Cobb-D Control	Yes

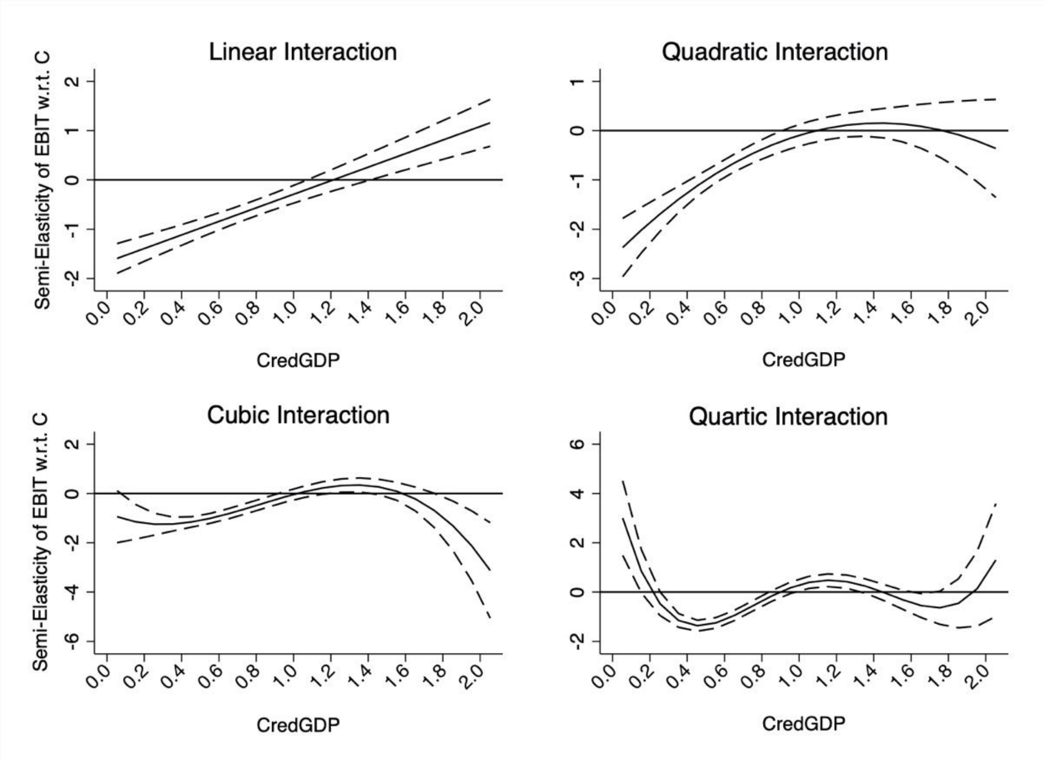
The table reports the OLS estimation from the panel data, based on Eq. (8). Cobb-Douglas control variables and productivity is still carried out in the regression, but not reported. C is the composite tax variable. PV is the political stability and absence of violence index from WGI. PV is interacted with C-measure to capture the conditional effect of PV on C. The output from the regression in plotted in the Figure B1.

B 2:Polynomial Interaction between Semi-Elasticity and Financial Development

	(1) Linear	(2) Quadratic	(3) Cubic	(4) Quartic
Labour	0.485***	0.484***	0.484***	0.484***
	(0.003)	(0.003)	(0.003)	(0.003)
Capital	0.299***	0.299***	0.299***	0.299***
	(0.002)	(0.002)	(0.002)	(0.002)
C	-1.666***	-2.573***	-0.774	4.589***
	(0.162)	(0.342)	(0.657)	(1.005)
CredGDP	-0.107***	-0.148	-1.385***	-4.771***
	(0.028)	(0.090)	(0.217)	(0.408)
CredGDP x C	1.375***	3.807***	-3.467	-32.316***
	(0.179)	(0.801)	(2.417)	(4.859)
$CredGDP^2$		0.018	1.441***	7.248***
		(0.037)	(0.233)	(0.649)
$CredGDP^2$ x C		-1.329***	7.113***	58.096***
		(0.414)	(2.675)	(8.042)
$CredGDP^3$ x C			-0.471***	-4.339***
			(0.076)	(0.417)
$CredGDP^3$ x C			-2.912***	-38.683***
			(0.908)	(5.467)
$CredGDP^4$ x C				0.885***
				(0.095)
$CredGDP^4$ x C				8.607***
				(1.309)
Obs.	457,485	457,485	457,485	457,485
R-squared	0.745	0.745	0.745	0.745
Year Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes

*The table reports the OLS estimation from the panel data, based on Eq. (8). The dependent variable is the log of EBIT. Capital is the log of fixed assets. Labour is the log of total cost of employees. CredGDP is the domestic credit to private sector as a percentage of GDP. C is the composite tax variable. For each of the four regressions we include CredGDP raised to the power of 1, 2, 3 and 4 for respectively regression 1, 2, 3 and 4. All orders of the CredGDP measure is interacted with the C-measure. Standard errors clustered at the group level are reported in the parenthesis. ***, **, * respectively denotes significance level of 1, 5 and 10%.*

B 3: Polynomial Interaction between Semi-Elasticity and Financial Development

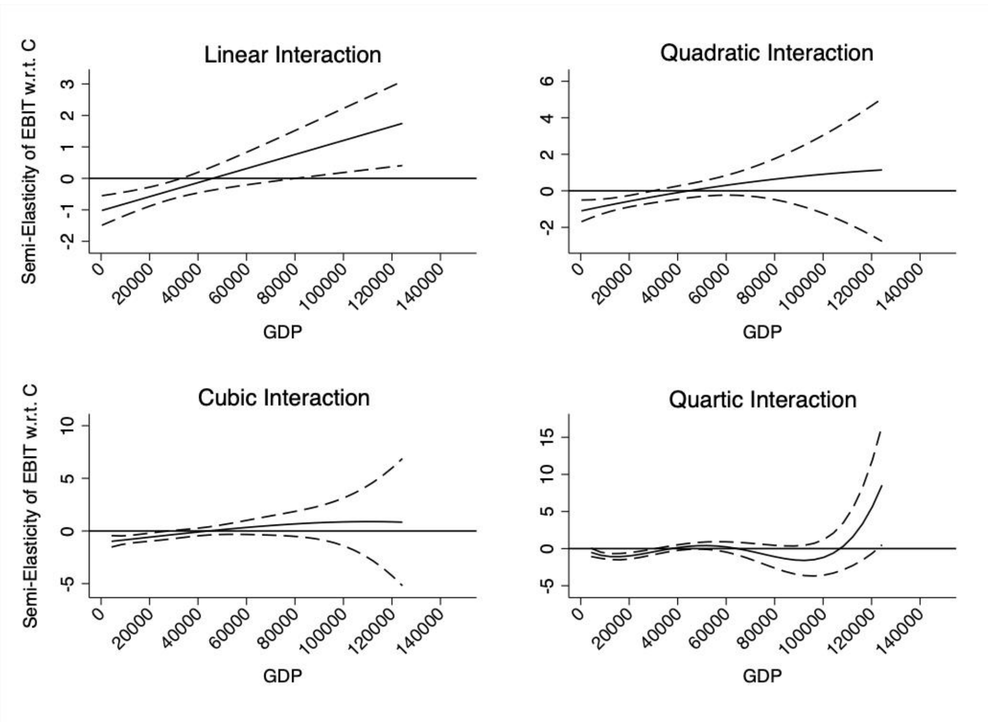


B 4: Polynomial Interaction between Semi-Elasticity and Development – 50% Restriction

	(1) Linear	(2) Quadratic	(3) Cubic	(4) Quartic
Labour	0.433***	0.433***	0.433***	0.432***
	(0.004)	(0.004)	(0.004)	(0.004)
Capital	0.296***	0.296***	0.296***	0.296***
	(0.003)	(0.003)	(0.003)	(0.003)
C	-1.028***	-1.106***	-1.090***	0.218
	(0.242)	(0.307)	(0.399)	(0.476)
GDP	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
GDP x C	0.000***	0.000	0.000	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
GDP^2		-0.000***	-0.000***	-0.000***
		(0.000)	(0.000)	(0.000)
GDP^2 x C		-0.000	0.000	0.000***
		(0.000)	(0.000)	(0.000)
GDP^3			0.000***	0.000*
			(0.000)	(0.000)
GDP^3 x C			-0.000	-0.000***
			(0.000)	(0.000)
GDP^4				-0.000
				(0.000)
GDP^4 x C				0.000***
				(0.000)
Obs.	286,118	286,118	286,118	286,118
R-squared	0.664	0.664	0.664	0.664
Year Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes

*The table reports the OLS estimation from the panel data, based on Eq. (8). All regressions are restricted to only include MNEs where 50% of subsidiaries are in the sample after restrictions. The dependent variable is the log of EBIT. Capital is the log of fixed assets, Labour is the log of total cost of employees, GDP is the GDP per capita and C is the composite tax variable. For each of the four regressions we include GDP raised to the power of 1, 2, 3 and 4 for respectively regression 1, 2, 3 and 4. All orders of the GDP measure is interacted with the C-measure. Standard errors clustered at the group level are reported in the parenthesis. ***, **, * respectively denotes significance level of 1, 5 and 10%.*

B 5: Polynomial Interaction between Semi-Elasticity and Development – 50% Restriction



B 6: Robustness Country Risk Measurements – 50% Restriction

	(1) Compliance Costs	(2) Corruption in The Tax Administration	(3) Political Uncertainty
C	-0.899**	0.264	-0.519***
	(0.375)	(0.208)	(0.153)
Risk 10-30	0.025		
	(0.017)		
Risk 10-30 x C	-0.438		
	(0.395)		
Risk 30-50	0.027	0.047	
	(0.020)	(0.031)	
Risk 30-50 x C	0.579	-2.216***	
	(0.428)	(0.331)	
Risk 50-75	-0.048**	0.030	
	(0.021)	(0.035)	
Risk 50-75 x C	0.629	-0.839***	
	(0.412)	(0.315)	
Risk 75	-0.057**		
	(0.025)		
Risk 75 x C	1.047**		
	(0.433)		
Risk 75-99		0.035	
		(0.037)	
Risk 75-99 x C		-0.383	
		(0.307)	
Risk 75-90			-0.002
			(0.007)
Risk 75-90 x C			0.358**
			(0.170)
Risk 99		0.021	
		(0.066)	
Risk 99 x C		-2.924	
		(1.990)	
Risk 90-95			0.037***
			(0.009)
Risk 90-95 x C			0.984***
			(0.269)
Risk 95			-0.023*
			(0.012)
Risk 95 x C			-1.032***
			(0.279)
Observations	286,118	286,118	286,118
R-squared	0.664	0.664	0.664
Year Fixed Effects	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes

*The table reports the OLS estimation from the panel data, based on Eq. (8). All regressions are restricted to only include MNEs where 50% of subsidiaries are in the sample after restrictions. The dependent variable is the log of EBIT. C is the composite tax variable. Risk is respectively paying taxes index, control of corruption index and yearly change in political risk. In each regression the percentiles are used as dummy variables, and each percentile is also interacted with the C-measure. Standard errors clustered at the group level are reported in the parenthesis. ***, **, * respectively denotes significance level of 1, 5 and 10%.*

Appendix C – Extended Summary Statistics

C 1: Extended Summary Statistics

	Obs.	Mean	Std. Dev.	Min	Median	Max
Firm Characteristics						
FA	463,125	181,189.06	6,328,940.22	0.07	503.00	2,885,649,123
TA	463,125	493,324.54	16,857,231.61	1.00	3264.00	4,030,650,521
TL	463,125	174,495.96	5,579,795.00	0.00	1478.00	2,011,782,881
Sales	463,125	166,188.89	2,322,075.67	0.00	3291.00	522,096,876
EBIT	463,125	14,662.94	410,359.15	0.04	270.00	167,150,838
Log EBIT	463,125	5.85	2.69	-3.22	5.60	18.93441
EBT	449,839	19,884.25	540,907.70	-20651322.00	221.00	160,848,500
Log EBT	424,989	5.87	2.81	0.00	5.62	18.90
IntExp	449,839	-5,040.58	274,783.54	-58531939.00	1.00	23,292,920
Log IntExp	248,406	3.87	2.90	-4.61	3.40	1.69
COE	463,125	19,442.18	788,777.44	0.00	686.89	398,277,500
EMPL	463,125	332.22	4,440.95	0.00	10.00	1,089,328
Leverage	463,125	0.54	0.28	0.00	0.56	1.00
Capital	463,125	6.50	3.47	-2.66	6.22	21.78
Labour	463,125	6.61	2.72	-6.65	6.53	1.98
C	463,125	-0.01	0.06	-0.39	0.00	0.64
C vis-a-vis parent	463,125	-0.03	0.10	-0.46	-0.03	0.41
C vis-a-vis-subs	463,125	0.00	0.05	-0.32	0.00	0.64
C (B = 1)	463,125	-0.01	0.07	-0.34	-0.02	0.64
C (B = TA)	463,125	-0.01	0.06	-0.38	0.00	0.66
TotalSubs	463,125	10.06	14.37	1.00	2.00	86.00
NN	463,125	4.03	5.18	1.00	1.00	35.00
TA p	54,522	14,240,304.86	65,568,735.31	-1,412.00	40,894.50	1,930,110,000
Sales p	38,261	8,476,930.17	23,287,773.54	-1,704.00	45,032.00	265,595,000
Country Variables						
CIT i	463,125	0.23	0.07	0.00	0.22	0.55
CIT p	463,125	0.26	0.08	0.00	0.26	0.55
GDP	463,125	29,629.38	20,011.35	315.78	28,170.43	189,422.22
CredGDP	457,485	0.81	0.38	0.05	0.77	2.55
Std. Dev. GDP	420,817	0.44	0.58	0.01	0.30	11.54
Log GDP	463,125	10.02	0.84	5.76	10.25	12.15
ΔGDP	463,015	1.00	0.00	0.66	1.00	1.56
GNI	462,734	29,068.41	18,793.19	340.00	28,430.00	107,530.00
Country Risk Variables						
PV	463,125	39.88	10.63	16.80	40.00	106.20
CC	463,122	34.60	17.07	2.00	38.60	78.00
PT	460,302	24.41	10.93	0.00	22.10	80.00
ΔPV	463,125	1.01	0.06	0.76	1.00	1.62
GE	463,122	32.13	13.47	5.20	30.00	77.40
RQ	463,122	30.07	11.29	4.80	30.80	88.60
RL	463,124	31.78	14.06	8.00	30.40	85.60
VA	463,125	31.06	9.47	15.20	29.40	83.20
ΔCC	463,125	1.01	0.10	0.62	1.00	2.66
CR	463,122	33.25	11.71	12.53	32.80	79.63
CPI	460,300	40.07	16.36	5.00	42.00	85.00
TaxPayments	406,517	32.45	24.86	1.00	33.00	61.00
TaxTime	406,517	74.12	57.24	1.00	79.00	203.00
WBES	25,004	5.69	8.72	0.00	2.50	50.00

C 2: Number of Firms by Country

Country	Host	Home	Country	Host	Home	Country	Host	Home
Afghanistan	0	67	Finland	7,843	5,267	Oman	38	51
Albania	42	1,582	France	34,814	23,184	Pakistan	227	393
Algeria	189	1,823	Gabon	6	46	Palestine	0	5
Andorra	0	94	Gambia	0	4	Panama	13	864
Angola	0	133	Georgia	13	90	Papua New Guinea	7	0
Anguilla	0	219	Germany	18,755	57,130	Paraguay	0	4
Antigua and Barbuda	0	8	Ghana	32	94	Peru	0	159
Argentina	6	193	Gibraltar	0	336	Philippines	41	206
Armenia	3	155	Greece	59	3,792	Poland	23,220	3,751
Aruba	0	21	Grenada	0	1	Portugal	12,519	2,859
Australia	5,788	3,644	Guatemala	0	6	Qatar	0	137
Austria	5,872	16,948	Guinea	0	36	Romania	46,643	4,027
Azerbaijan	0	137	Honduras	0	2	Russian Federation	662	3,743
Bahamas	10	235	Hong Kong	229	2,090	Rwanda	0	4
Bahrain	1	39	Hungary	12,219	6,117	Saint Kitts and Nevis	0	70
Bangladesh	111	216	Iceland	168	282	Saint Lucia	0	10
Barbados	0	48	India	11,564	2,207	Saint Vincent & the Grenadines	0	104
Belarus	1	301	Indonesia	318	99	Samoa	1	42
Belgium	15,202	11,144	Iraq	7	149	Saudi Arabia	0	286
Belize	0	251	Ireland	4,190	4,348	Senegal	8	70
Benin	0	27	Israel	81	2,396	Serbia	11,208	1,976
Bermuda	310	1,758	Italy	44,618	28,570	Seychelles	1	826
Bolivia	0	31	Jamaica	27	37	Sierra Leone	0	20
Bosnia and Herzegovina	3,383	1,353	Japan	1,122	15,661	Singapore	305	1,633
Botswana	19	19	Jordan	36	153	Sint Maarten	0	16
Brazil	21	839	Kazakhstan	0	161	Slovakia	21,507	3,650
British Virgin Islands	0	3,688	Kenya	86	52	Slovenia	5,597	3,214
Brunei Darussalam	6	7	Kuwait	14	221	South Africa	44	826
Bulgaria	14,071	2,102	Kyrgyzstan	0	16	South Korea	6,424	2,223
Burkina Faso	8	0	Laos	0	51	Spain	24,882	10,095
Burundi	0	2	Latvia	675	703	Sri Lanka	87	140
Cabo Verde	0	29	Lebanon	4	1,100	Sudan	0	14
Cambodia	0	89	Liberia	0	66	Suriname	0	380
Cameroon	12	144	Libya	0	39	Sweden	13,701	13,727
Canada	276	4,231	Liechtenstein	6	1,773	Switzerland	287	20,803
Cayman Islands	2,481	3,805	Lithuania	23	872	Syrian Arab Republic	0	664
Chile	21	207	Luxembourg	4,673	12,225	Taiwan	0	1,200
China	10	10,179	Macao	0	115	Tanzania	37	23
Colombia	0	75	Madagascar	0	72	Thailand	1,452	340
Congo	0	76	Malawi	8	7	Togo	0	1
Costa Rica	0	46	Malaysia	1,220	734	Trinidad and Tobago	8	7
Côte d'Ivoire	95	40	Malta	186	908	Tunisia	18	412
Croatia	9,486	2,722	Mauritania	0	34	Turkey	130	5,566
Cuba	0	9	Mauritius	4	1,175	Turkmenistan	0	5
Curaçao	0	648	Mexico	0	452	Uganda	15	14
Cyprus	82	6,877	Moldova	11	1,193	Ukraine	4,421	2,208
Czechia	25,529	7,406	Monaco	3	482	United Arab Emirates	13	1,352
Denmark	5,974	8,776	Mongolia	0	6	United Kingdom	28,305	24,117
Djibouti	0	8	Montenegro	803	395	United States	341	53,319
Dominica	3	24	Morocco	2,307	1,829	Uruguay	0	124
Dominican Republic	0	50	Mozambique	0	11	Uzbekistan	0	61
DRC Congo	0	4	Myanmar	4	0	Vanuatu	0	5
Ecuador	5	84	Nepal	3	24	Venezuela	0	163
Egypt	52	628	Netherlands	5,118	18,815	Viet Nam	67	208
El Salvador	0	11	New Zealand	4,642	419	Yemen	0	2
Estonia	5,540	1,096	Nicaragua	0	127	Zambia	40	2
Eswatini	1	1	Nigeria	126	107	Zimbabwe	31	41
Ethiopia	0	24	North Macedonia	2,816	1,089			
Fiji	19	4	Norway	7,363	5,108			

C 3: Number of Firms by Continent

Continet	Host		Home	
Africa	3,139	0.68%	8,783	1.90%
Asia	23,400	5.05%	45,068	9.73%
Europe	422,607	91.25%	332,834	71.87%
North America	927	0.20%	59,308	12.81%
Oceania	10,457	2.26%	4,114	0.89%
South & Central America	2,595	0.56%	13,018	2.81%
Total	463,125	100.00%	463,125	100.00%

C 4: Average Corporate Income Tax Rate – in Percentage

Country	Tax Rate	Country	Tax Rate	Country	Tax Rate
Afghanistan	20.00	France	33.03	Palestine	15.00
Albania	13.33	Gabon	31.67	Panama	25.00
Algeria	24.89	Gambia	31.00	Papua New Guinea	30.00
Andorra	10.00	Georgia	15.00	Paraguay	10.00
Angola	32.22	Germany	29.69	Peru	29.39
Anguilla	0.00	Ghana	25.00	Philippines	30.00
Antigua and Barbuda	25.00	Gibraltar	10.00	Poland	19.00
Argentina	33.89	Greece	26.22	Portugal	22.56
Armenia	20.00	Grenada	30.00	Qatar	10.00
Aruba	26.33	Guatemala	26.50	Romania	16.00
Australia	30.00	Guinea	35.00	Russian Federation	20.00
Austria	25.00	Honduras	27.50	Rwanda	30.00
Azerbaijan	20.00	Hong Kong	16.50	St. Kitts and Nevis	33.44
Bahamas	0.00	Hungary	15.67	St. Lucia	30.00
Bahrain	0.00	Iceland	20.00	St. Vincent & the Grenadines	32.00
Bangladesh	26.11	India	33.52	Samoa	27.00
Barbados	23.39	Indonesia	25.00	Saudi Arabia	20.00
Belarus	18.67	Iraq	15.00	Senegal	28.89
Belgium	32.88	Ireland	12.50	Serbia	13.89
Belize	25.00	Israel	24.50	Seychelles	31.44
Benin	30.00	Italy	28.93	Sierra Leone	30.00
Bermuda	0.00	Jamaica	26.85	Singapore	17.00
Bolivia	25.00	Japan	34.38	Sint Maarten	34.60
Bosnia and Herzegovina	10.00	Jordan	17.33	Slovakia	21.11
Botswana	22.00	Kazakhstan	20.00	Slovenia	18.11
Brazil	34.00	Kenya	30.00	South Africa	29.46
British Virgin Islands	0.00	Kuwait	15.00	South Korea	23.89
Brunei Darussalam	19.75	Kyrgyzstan	10.00	Spain	27.56
Bulgaria	10.00	Laos	25.67	Sri Lanka	26.56
Burkina Faso	27.56	Latvia	16.11	Sudan	35.00
Burundi	30.00	Lebanon	15.22	Suriname	35.36
Cabo Verde	25.00	Liberia	25.00	Sweden	22.89
Cambodia	20.00	Libya	20.00	Switzerland	17.99
Cameroon	34.28	Liechtenstein	12.50	Syrian Arab Republic	25.33
Canada	26.56	Lithuania	15.00	Taiwan	17.67
Cayman Islands	0.00	Luxembourg	28.06	Tanzania	30.00
Chile	22.78	Macao	12.00	Thailand	21.44
China	25.00	Madagascar	20.33	Togo	28.00
Colombia	29.56	Malawi	30.00	Trinidad and Tobago	25.00
Congo	32.11	Malaysia	24.44	Tunisia	26.67
Costa Rica	30.00	Malta	35.00	Turkey	20.44
Côte d'Ivoire	25.00	Mauritania	25.00	Turkmenistan	20.00
Croatia	19.56	Mauritius	15.00	Uganda	30.00
Cuba	15.00	Mexico	30.00	Ukraine	19.22
Curaçao	25.22	Moldova	10.67	United Arab Emirates	55.00
Cyprus	11.94	Monaco	33.26	United Kingdom	21.22
Czechia	19.00	Mongolia	25.00	United States	37.11
Denmark	23.28	Montenegro	9.00	Uruguay	25.00
Djibouti	25.00	Morocco	30.56	Uzbekistan	8.06
Dominica	27.56	Mozambique	32.00	Vanuatu	6.80
Dominican Republic	27.78	Myanmar	25.00	Venezuela	34.00
DRC Congo	35.00	Nepal	25.00	Viet Nam	22.33
Ecuador	23.00	Netherlands	25.00	Yemen	20.00
Egypt	23.11	New Zealand	28.00	Zambia	35.00
El Salvador	30.00	Nicaragua	30.00	Zimbabwe	25.50
Estonia	20.44	Nigeria	30.00		
Eswatini	27.50	North Macedonia	10.00		
Ethiopia	25.86	Norway	25.78		
Fiji	22.00	Oman	13.00		
Finland	21.67	Pakistan	32.78		

C 5: Correlation Matrix

	Log EBIT	C	Capital	Labour	Log GDP	PT	PV	ΔPV
C	-0.027** (0.003)							
Capital	0.773*** (0.000)	-0.001 (0.366)						
Labour	0.799*** (0.000)	-0.007*** (0.000)	0.705*** (0.000)					
Log GDP	0.201*** (0.000)	0.058*** (0.000)	0.148*** (0.000)	0.296*** (0.000)				
PT	-0.166*** (0.000)	0.118*** (0.000)	-0.110*** (0.000)	-0.196*** (0.000)	-0.542*** (0.000)			
PV	-0.038*** (0.000)	0.109*** (0.000)	-0.018*** (0.000)	-0.081*** (0.000)	-0.655*** (0.000)	0.444*** (0.000)		
ΔPV	0.007*** (0.000)	0.017*** (0.000)	0.001 (0.377)	0.015*** (0.000)	0.048*** (0.000)	0.009*** (0.000)	0.078*** (0.000)	
CC	-0.292*** (0.000)	-0.064*** (0.000)	-0.220*** (0.000)	-0.381*** (0.000)	-0.810*** (0.000)	0.645*** (0.000)	0.555*** (0.000)	-0.071*** (0.000)

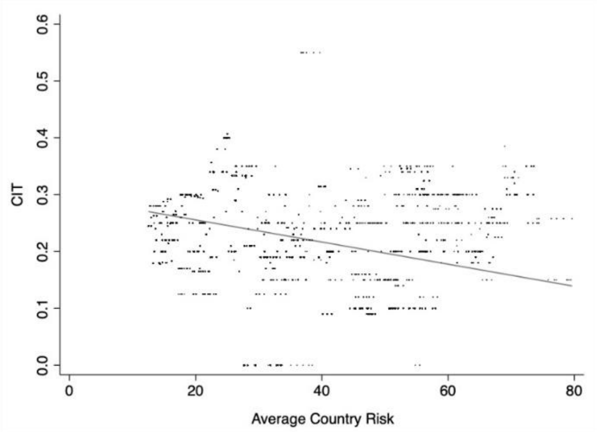
*The table reports the correlation with associated p-values for the model variables on firm, country and risk level. The data is set worldwide from 2011 – 2019. Log EBIT is the log of earnings before interest and taxes. Leverage is the affiliates debt-ratio. C is the composite tax variable. Capital is the log of fixed assets. Labour is the log of total cost of employees. Log GDP is the log of GDP per capita. PT is the paying taxes index, measuring the compliance costs. PV measures the political stability and absence of violence. ΔPV measures the yearly change in political stability and absence of violence. CC measures the control of corruption. PT, PV, ΔPV and CC are all provided by the World Bank. The number of firms included in the sample is 463,125. P-values noted in the parenthesis. ***, **, * respectively denotes significance level of 1, 5 and 10 %.*

C 6: Correlation Between Change in Country Risk Measurements

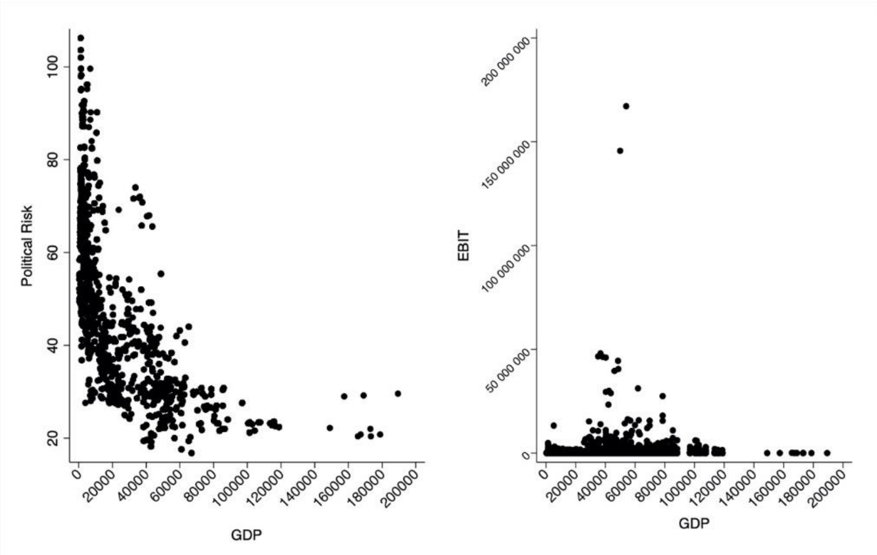
	ΔPV	ΔCC	ΔPT	ΔRL	ΔGE	ΔVA	ΔRQ	ΔCPI	PV	CC	PT
ΔCC	0.001 (0.392)										
ΔPT	-0.002 (0.262)	0.017*** (0.000)									
ΔRL	0.007*** (0.000)	0.020*** (0.000)	0.013*** (0.000)								
ΔGE	0.007*** (0.000)	0.213*** (0.000)	0.044*** (0.000)	0.218*** (0.000)							
ΔVA	0.004*** (0.004)	0.278*** (0.000)	0.019*** (0.000)	0.035*** (0.000)	0.075*** (0.000)						
ΔRQ	0.008*** (0.000)	0.094*** (0.000)	0.113*** (0.000)	0.273*** (0.000)	0.375*** (0.000)	0.099*** (0.000)					
ΔCPI	-0.002 (0.227)	-0.117*** (0.000)	0.019*** (0.000)	0.055*** (0.000)	-0.124*** (0.000)	-0.154*** (0.000)	-0.208*** (0.000)				
PV	0.078*** (0.000)	-0.005*** (0.001)	-0.001 (0.455)	-0.001 (0.692)	-0.004** (0.016)	-0.004** (0.015)	0.002 (0.226)	0.010*** (0.000)			
CC	-0.071*** (0.000)	-0.005*** (0.002)	-0.002 (0.202)	-0.002 (0.214)	-0.005*** (0.000)	-0.003** (0.024)	0.0001 (0.939)	0.011*** (0.000)	0.556*** (0.000)		
PT	-0.009*** (0.000)	-0.005*** (0.000)	0.002 (0.129)	-0.004** (0.012)	-0.005*** (0.001)	-0.005** (0.002)	0.0003 (0.865)	0.006*** (0.000)	0.446*** (0.000)	0.646*** (0.000)	
CPI	-0.074*** (0.000)	-0.006*** (0.000)	-0.002 (0.155)	-0.002 (0.117)	-0.005*** (0.000)	-0.004** (0.016)	-0.001 (0.599)	-0.015*** (0.000)	0.568*** (0.000)	0.970*** (0.000)	0.615*** (0.000)

*The table reports the correlation with associated p-values for the model variables on risk level. The data is set worldwide from 2011 – 2019. The notation Δ stands for yearly change in the metric. PV measures the political stability and absence of violence. CC measures the control of corruption. PT is the paying taxes index, measuring the compliance costs. RL is the rule of law. GE is government effectiveness. VA is voice and accountability. RQ is regulatory requirement. CPI is the Corruption Perception Index. P-values noted in the parenthesis. ***, **, * respectively denotes significance level of 1, 5 and 10%.*

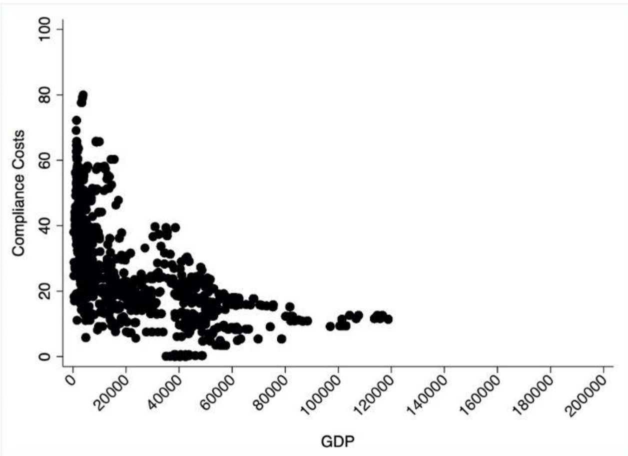
C 7: CIT Home Country vs Average Country Risk



C 8: Political Risk vs. GDP & EBIT vs. GDP



C 9: Compliance Costs vs. GDP



Appendix D – Extended References and Sources

D 1: Corporate Income Tax Rate References

CIT from 2011 – 2019 for Afghanistan, Albania, Angola, Argentina, Aruba, Australia, Austria, Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Bermuda, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Cambodia, Canada, Cayman Islands, Chile, China, Colombia, Costa Rica, Croatia, Curacao, Cyprus, Czech Republic, Denmark, Dominican Republic, Ecuador, Egypt, Estonia, Fiji, Finland, France, Germany, Gibraltar, Greece, Guatemala, Honduras, Hong Kong SAR, Iceland, India, Indonesia, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Korea, Republic of, Kuwait, Latvia, Libya, Liechtenstein, Lithuania, Luxembourg, Macau, Macedonia, Malaysia, Malta, Mauritius, Mexico, Montenegro, Mozambique, Netherlands, New Zealand, Nigeria, Norway, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russia, Samoa, Saudi Arabia, Serbia, Singapore, Sint Maarten (Dutch part), Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sudan, Sweden, Switzerland, Syria, Taiwan, Tanzania, Thailand, Tunisia, Turkey, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Vanuatu, Venezuela, Vietnam, Yemen, Zambia and Zimbabwe.

CIT from 2012 – 2019 for El Salvador, Kenya, Malawi and Trinidad and Tobago.

CIT from 2013 – 2019 for Algeria, Georgia, Ghana, Iraq, Lebanon, Morocco and Suriname.

CIT from 2014 – 2019 for Sierra Leone.

CIT from 2015 – 2019 for Cameroon and Moldova.

CIT from 2016 – 2019 for Uzbekistan.

CIT from 2017 – 2019 for Andorra, Anguilla, Antigua and Barbuda, Azerbaijan, Benin, British Virgin Island, Brunei Darussalam, Burkina Faso, Burundi, Djibouti, Dominica, Gabon, Gambia, Ivory Coast, Kyrgyzstan, Madagascar, Monaco, Mongolia, Myanmar, Nicaragua, Palestinian Territory, Rwanda, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Senegal and Turkmenistan.

Retrieved August 23, 2020, from:

https://home.kpmg/xx/en/home/services/tax/tax-tools-and-resources/tax-rates-online/corporate-tax-rates-table.html

CIT from 2015 – 2019 for Lao.

CIT from 2016 – 2019 for Kosovo.

CIT from 2015 – 2016 for Dominica, Gabon, Gambia and Grenada.

CIT from 2015 – 2019 for Congo.

CIT in 2016 for Djibouti.

Retrieved August 23, 2020, from: https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Tax/dttl-tax-corporate-tax-rates-2015-2019.pdf

CIT in 2014 for Lao, Cameroon, Congo and Gabon.

CIT from 2014 – 2016 for Burkina Faso, Burundi, Dominica, Ivory Coast, Palestinian Territory and Rwanda.

Retrieved August 23, 2020, from: https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Tax/dttl-tax-corporate-tax-rates-2014-2018.pdf

CIT from 2013 – 2016 for Andorra, Anguilla, Antigua and Barbuda, Azerbaijan, Benin, Brunei, Kyrgyzstan, Madagascar, Monaco, Mongolia, Myanmar, Nicaragua, Saint Kitts and Nevis, Saint Lucia, Turkmenistan.

CIT from 2013 – 2014 for Senegal.

CIT from 2013 – 2015 for Uzbekistan.

CIT in 2014 for Grenada.

Retrieved August 23, 2020, from: https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Tax/dttl-tax-corporate-tax-rates-2013-2017.pdf

CIT in 2012 for Benin, Gabon and Rwanda.

CIT from 2012 – 2013 for Burundi

Retrieved September 3, 2020, from: https://issuu.com/svengvp/docs/deloitte-key-economies-in-africa-2012-3

CIT from 2011 – 2019 for Seychelles, D.R. Congo, Eswatini and Ethiopia.

CIT in 2012 for Algeria.

CIT from 2013 – 2015 for Kosovo and Moldova.

Retrieved August 24, 2020, from:
https://tradingeconomics.com

CIT from 2011 – 2012 for Kosovo.
Retrieved September 2, 2020, from:
https://dergipark.org.tr/tr/download/article-file/773536

CIT in 2011 for Monaco.
Retrieved August 25, 2020, from:
https://www.moore-global.com/MediaLibsAndFiles/media/MooreStephens/Documents/DPS16236-monaco-2011-05-19.pdf

CIT from 2011 – 2013 for British Virgin Island.
Retrieved August 25, 2020, from:
https://www.pkf.com/media/1954323/british%20virgin%20islands%20pkf%20tax%20guide%202013.pdf

CIT in 2011 for Algeria.
Retrieved September 2, 2020, from:
https://www.pkf.com/media/1944991/algeria%20pkf%20tax%20guide%202013.pdf

CIT from 2011 – 2012 for Antigua and Barbuda.
Retrieved September 1, 2020, from:
http://forms.gov.ag/ird/pit/F01_Corporation_incometax_guide.pdf
http://forms.gov.ag/ird/pit/ABST_Return_Payments_Guide.pdf

CIT from 2011 – 2012 for Andorra.
Retrieved August 25, 2020, from:
https://www.lowtax.net/features/Andorra-Focus-573395.html

CIT in 2011 for Senegal, Madagascar, Moldova, Morocco, Georgia, Gabon, Lebanon, Iraq, Brunei, Azerbaijan, Mauritania, Guinea, Congo, El Salvador, Ivory Coast, Nicaragua, Palestinian Territory, Rwanda, Uzbekistan and Laos.
Retrieved August 25, 2020, from:
https://assets.ey.com/content/dam/ey-sites/ey-com/en_gl/topics/tax/guides/ey-worldwide-corporate-tax-guide-2011.pdf

CIT in 2012 for Azerbaijan, Brunei, Georgia, Ghana, Lebanon, Madagascar, Mongolia, Morocco, Nicaragua, Senegal, Uzbekistan, Mauritania, Guinea, Laos, Iraq, Palestine Territory and Moldova.

Retrieved August 25, 2020, from:

https://assets.ey.com/content/dam/ey-sites/ey-com/en_gl/topics/tax/guides/ey-worldwide-corporate-tax-guide-2012.pdf

CIT in 2013 for Cameroon, Congo, Moldova, Guinea, Palestine Territory and Laos.

Retrieved August 24, 2020, from:

https://assets.ey.com/content/dam/ey-sites/ey-com/en_gl/topics/tax/guides/ey-worldwide-corporate-tax-guide-2013.pdf

CIT from 2014 – 2019 for British Virgin Island.

Retrieved August 25, 2020, from:

Collected from EY Worldwide Corporate Tax Guides from 2014 - 2019:

https://www.ey.com/en_gl/tax-guides/tax-guide-library-archive

CIT in 2011 for Benin.

Retrieved September 3, 2020, from:

https://www.verginet.net/Dokumanlar/ulkeler/2011-Benin-tax.pdf

CIT from 2011 – 2019 for Liberia and Belize.

CIT from 2011 – 2016 for Saint Vincent and the Grenadines.

CIT from 2011 – 2013 for Burkina Faso, Dominica and Grenada.

CIT from 2011 – 2012 for Anguilla and Saint Lucia.

CIT in 2012 for Monaco and Ivory Coast.

CIT from 2017 – 2019 for Grenada.

Retrieved August 25, 2020, from:

https://stats.oecd.org/Index.aspx?DataSetCode=CTS_CIT

CIT in 2019 for Mauritania, Togo and Guinea.

Retrieved August 24, 2020, from:

https://www2.deloitte.com/content/dam/Deloitte/za/Documents/tax/za_Africa_Key_Fiscal_Guide_2019.pdf

CIT in 2018 for Mauritania, Togo and Guinea.

Retrieved September 3, 2020, from:

https://www2.deloitte.com/content/dam/Deloitte/za/Documents/tax/za_Key_Fiscal_Guide_2018_17518.pdf

CIT in 2017 for Mauritania, Togo and Guinea.
Retrieved September 3, 2020, from:
ttps://www2.deloitte.com/content/dam/Deloitte/na/Documents/tax/na-Deloitte-Key-Economies-in-Africa-Fiscal-Guide-2017.pdf

CIT in 2016 for Guinea and Mauritania.
Retrieved September 3, 2020, from:
https://www2.deloitte.com/content/dam/Deloitte/za/Documents/za_tax-fiscal-guide-2016_tax_110216.pdf

CIT from 2014 – 2015 for Guinea and Mauritania.
Retrieved September 3, 2020, from:
https://www2.deloitte.com/content/dam/Deloitte/na/Documents/tax/na_ZA_Fiscal_Guide_2015_29012015.pdf

CIT in 2013 for Gabon, Ivory Coast, Mauritania and Rwanda.
Retrieved September 3, 2020, from:
https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Tax/dttl-tax-africa-guide-to-fiscal-information-2013-14.pdf?utm_source=Mondaq&utm_medium=syndication&utm_campaign=inter-article-link

CIT from 2011 – 2012 for Ghana, Kenya, Malawi and Cameroon.
Retrieved August 25, 2020, from:
https://issuu.com/svengvp/docs/deloitte-guide-to-fiscal-information

CIT from 2013 – 2015 for Nepal.
Retrieved August 24, 2020, from:
https://www.aaptaxlaw.com/World-Taxes/Nepal-Income-Tax-Rates-FY-2014-2015-Corporation-Tax-Rate-Personal-Income-Tax-in-Nepal.html

CIT from 2016 – 2019 for Nepal.
Retrieved August 25, 2020, from:
https://www.pwc.com/jp/en/issues/globalization/country/india/assets/pdf/doing-business-in-nepal2019.pdf
http://pkf.trunco.com.np/uploads/publication/file/Nepal%20Taxation%20Guide%202018_20180801041445_20181126030832.pdf
https://www.nbsm.com.np/assets/kcfinder/upload/files/Publication/NBSM-Budget-2076-7.pdf
https://www.nbsm.com.np/assets/kcfinder/upload/files/Publication/Nepal%20Tax%20Guide%202016.pdf

CIT in 2015 for Cuba.
Retrieved September 2, 2020, from:
http://www.iberglobal.com/files/2017/cuba_ey_investment.pdf

CIT from 2018 – 2019 for Cabo Verde.
Retrieved September 3, 2020, from:
https://taxsummaries.pwc.com/-/media/world-wide-tax-summaries/attachments/pwc-wwts---corporate-taxes-2018-19.ashx?revision=d7d1e141-b6d3-4028-b895-b60dbf2c566d&la=en&hash=03DE95D8583723496F476B7B11BAB5E9FDC14C81

CIT from 2016 – 2017 for Cabo Verde.
Retrieved September 3, 2020, from:
https://taxsummaries.pwc.com/-/media/world-wide-tax-summaries/attachments/worldwide-tax-summaries-corporate-taxes-2016-17.ashx?revision=cd70e928-c403-4229-af30-4f11ebae87e2&la=en&hash=6D28E22EB5B63D416570CE978179519402B81337

CIT in 2015 for Cabo Verde.
Retrieved September 3, 2020, from:
https://taxsummaries.pwc.com/-/media/world-wide-tax-summaries/attachments/pwc-worldwide-tax-summaries-corporate-2015-16.ashx?revision=f54cc1a3-e15f-4232-a137-b73c749acb52&la=en&hash=34E5B5E8D256D18A1EFAE4FC1B31F94061215C00

CIT from 2013 – 2014 for Cabo Verde.
Retrieved September 3, 2020, from:
https://taxsummaries.pwc.com/-/media/world-wide-tax-summaries/attachments/pwc-worldwide-tax-summaries-corporate-2013-14.ashx?revision=404bac6d-7d83-406f-80b7-3af4bfe6234a&la=en&hash=8C8C19DE455EAB082A4F673E888FE593DFBA7514

CIT from 2011 – 2012 for Saint Kitts and Nevis, Cabo Verde and Kyrgyzstan.
CIT in 2012 for Congo.
CIT in 2011 for Mongolia.
Retrieved September 3, 2020, from:
https://taxsummaries.pwc.com/-/media/world-wide-tax-summaries/attachments/pwc-wwts---corporate-summaries-2011-12.ashx?revision=c3fdf414-50e2-4a72-8917-7f41562f85fd&la=en&hash=54C1762D77DFBCDC40470752CF086A2D479168CF

D 2: Variable Description and Sources

Variable	Description	Source
Firm Characteristics		
FA	Fixed assets	Orbis
TA	Total assets	Orbis
TL	Total leverage	Orbis
Sales	Total sales	Orbis
EBIT	Earnings before interest and taxes	Orbis
Log EBIT	The log of earnings before interest and taxes, provided by Orbis	Self-Constructed
EBT	Earnings before interest	Orbis
Log EBT	The log of earnings before interest, provided by Orbis	Self-Constructed
IntExp	Interest expenses (EBIT - EBT), EBIT and EBT provided by Orbis	Self-Constructed
Log IntExp	The log of interest expenses	Self-Constructed
COE	Cost of employees	Orbis
EMPL	Total number of employees (labour compensation)	Orbis
Leverage	Debt-ratio (TL/TA), TL and TA provided by Orbis	Self-Constructed
Capital	The log of fixed assets, provided by Orbis	Self-Constructed
Labour	The log of cost of employees, provided by Orbis	Self-Constructed
C	Composite tax variable, representation of the tax incentive	Self-Constructed
C vis-a-vis-parent	Tax differential between the affiliate and the parent	Self-Constructed
C vis-à-vis-subs	Calculated by excluding the parent (before restrictions)	Self-Constructed
C (B = 1)	Calculated by the assumption that B equals 1 for all observations	Self-Constructed
C (B = TA)	Calculated by the assumption that B equals total assets	Self-Constructed
TotalSubs	Number of firms connected to the same MNE before sample restriction	Self-Constructed
NN	Number of firms connected to the same MNE after sample restriction	Self-Constructed
TA P	Parent´s total assets	Orbis
Sales P	Parent´s sales	Orbis
Country Variables		
CIT i	Top statutory corporate income tax rate for host country	See Appendix D1
CIT p	Top statutory corporate income tax rate for home country	See Appendix D1
GDP	GDP per capita (Total GDP/Population)	The World Bank
CredGDP	Domestic credit to private sector as a percentage of GDP	The World Bank
Std. Dev. GDP	The yearly standard deviation, calculated by quarterly change, provided by WB	Self-Constructed
Log GDP	The log of GDP per capita	The World Bank
ΔGDP	Yearly change in GDP	Self-Constructed
GNI	GNI per capita (Total GNI/Population)	The World Bank
Country Risk Variables		
PV	Political Stability and Absence of Violence (Worldwide Governance Indicators)	The World Bank
CC	Control of Corruption (Worldwide Governance Indicators)	The World Bank
PT	Paying Taxes Index	The World Bank
ΔPV	Yearly change in Political Stability and Absence of Violence	Self-Constructed
GE	Government Effectiveness (Worldwide Governance Indicators)	The World Bank
RQ	Regulatory Quality (Worldwide Governance Indicators)	The World Bank
RL	Rule of Law (Worldwide Governance Indicators)	The World Bank
VA	Voice and Accountability	The World Bank
ΔCC	Yearly change in Control of Corruption	Self-Constructed
CR	Average score of all the Worldwide Governance Indicators	Self-Constructed
CPI	Corruption Perception Index	Transparency International
TaxPayments	The number of yearly tax payments in a country	The World Bank
TaxTime	The number of yearly hours to comply with tax regulations	The World Bank
TaxGift	Percentage of firms expected to give gifts in meetings with tax officials	The World Bank
Prop	Property Rights Score	The World Bank