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Politics over Profits?

A quantitative study of the effect of state-ownership and development on the incentive to shift profits

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Abstract

The literature covers empirical evidence examining the profit shifting behaviour of multinational firms within advanced economies. With the increasing interest of governments in detecting profit shifting behaviour, few existing papers investigate if there are differences in the incentive to shift profits in countries classified as developing relative to more advanced economies. Moreover, due to the state's grip on the overall global economy and its presence in developing economies, it is interesting to investigate state-owned multinationals' response to a change in the tax differentials between affiliates. Following the novel method developed by Huizinga and Laeven (2008) and employing a panel data study on affiliate-year observations for 2013 to 2020, we ran regressions with different socio-political characteristics as categorisations on the dependent variable, earnings before interest and tax (EBIT). When analysing financial and ownership data provided by the Orbis database, we could not find a true relationship between the tax differential and the reported EBIT. Moreover, we could not find a significant difference between the tax incentives of state-owned multinationals and other multinationals. However, by categorising the observations after governance indicators, we observe positive levels of tax sensitivity with an increase in the government effectiveness and regulatory quality of a country. Thus, the multinationals' response to a change in the tax differential may be incentivised by differences in socio-political factors between affiliates with different host countries.

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1 Introduction

Corporate profit shifting has become big business, with firms avoiding paying their fair share of taxes (Johannesen et al., 2020). Multinational enterprises (MNEs) enter and operate in foreign countries to generate added value, greater competitiveness and increased profitability (Dunning and Lundan, 2008). In recent years, the state's grip on the global economy has become more impactful, with state-owned multinational enterprises (SOMNEs) controlling assets for other entities in foreign countries (IMF, 2020). Their presence significantly influences the national economic status and competitiveness, especially in emerging markets. Literature suggests that SOMNEs often weigh socio-political factors over profits (Cuervo-Cazurra et al., 2014), while other MNEs often prioritize profit maximization. The different objectives raise an interesting question regarding affiliates of SOMNEs and their incentives to shift profits, mainly because their existence goes beyond profit maximization.

While the tax revenue loss due to profit shifting is estimated to be USD 186 billion globally (Zucman et al., 2018), the magnitude is estimated to be USD 90 billion for developing countries (UNCTAD, 2015). Developing countries depend on corporate income tax (CIT) to gain growth, and mispriced cross-border transactions might pit governments of developing economies against large MNEs. Findings from the literature suggest that countries at lower levels of economic and institutional development are more exposed to cross-border profit shifting (Johannesen et al., 2020). Moreover, the lower income levels in developing countries mirror the lower quality of governance measured by corruption, government effectiveness, regulatory quality and other governance indicators. Johannesen et al. (2020) suggest that a goal for future research is to identify credible mechanisms that lead to low tax compliance in developing economies. Therefore, we sought to investigate how different governance indicators affect profit shifting.

Even though several tax-avoidance techniques are legal, many are illegal over a more extended period or occupy a grey area (Dharmapala and Riedel, 2013). Profit shifting by transfer pricing or international debt shifting is the dominant tax planning strategy used by MNEs (Beer et al., 2020). This thesis focuses on abusive transfer pricing for intra-firm transactions to shift profits to avoid taxes, as transfer pricing is the main form of profit shifting (Dharmapala and Riedel, 2013).

The understanding of common mechanisms used to shift profits to reduce the MNEs' overall tax burden has increased over the last decades (Heckemeyer and Overesch, 2017). However, profit shifting within SOMNEs is an area within the existing profit shifting literature that has not received much attention. Moreover, many SOMNEs operate in countries categorized as developing, where the tax revenue is fundamental for future economic growth.

Due to limited research regarding profit shifting for SOMNEs and developing economies, we aim to investigate the following:

Does a country's level of development determine the response to a change in the tax differential, and does this response differ for multinationals where the state is the majority owner?

To examine the research question, we estimate the tax differential for SOMNEs and MNEs and separate the observations into different levels of development. The firm-level data is obtained from the Orbis database, provided by Bureau van Dijk. Using the firm-level data, the baseline model builds on the methodology proposed by Hines and Rice (1994) and Huizinga and Laeven (2008). A pure replication of the model proposed by Huizinga and Laeven (2008) requires data on the cost of employees and sales for all firm observations. These variables are excluded in our regressions due to a lack of financial data. Thus, a pure replication of the model proposed by Huizinga and Laeven (2008) is difficult when data on the proxy for labour is missing. In our model, the tax differential builds on supplementing literature by Lohse and Riedel (2013). The newer approach enables the tax differential to be calculated as an average rather than weighted by sales.

The first part of the empirical analysis includes our baseline model. We expand the model by Huizinga and Laeven (2008) by using panel data from 2013 to 2020, which enables us to control for industry and country fixed effects. Firstly, the model includes an interaction term between affiliate observations where the MNE is categorized as state-owned and the tax differential to investigate the effect of state ownership on the tax differential. Secondly, the observations are divided into categories based on their gross national income (GNI), separating affiliates operating in host countries with differences in development. Running the regressions, the output from the baseline model suggests that we cannot identify a true relationship between the tax differential and the reported earnings before interest and tax (EBIT).

The development of a country is related to its perceived level of governance and other socio-political characteristics. To investigate the different tails of the distribution, we include national governance indicators such as control of corruption, regulatory quality, unemployment and government effectiveness. With the inclusion of regulatory quality and government effectiveness as proxies for development, we found that affiliates operating in countries with higher regulatory quality and government effectiveness face a higher tax sensitivity relative to countries in the lower distribution. The finding of a positive point estimate of the semi-elasticity is contrary to previous literature on profit shifting. However, few empirical papers investigate differences in development, which might suggest that affiliates within countries with higher development have fewer incentives to shift profits.

Persistent throughout the analysis, we found that the effect of the SOMNEs on the tax differential is not statistically different from that of other MNEs. However, a substantial limitation in our analysis is the lack of financial firm-level data on affiliates within SOMNEs.

Several robustness tests investigate the robustness of the point estimates in our analysis. Firstly, the weighted tax differential is proxied for the tax differential. The test is carried out on the regressions using government effectiveness and regulatory quality, because these regressions include statistically significant estimates. Secondly, we removed MNEs with only one foreign affiliate to investigate if the estimates are robust on larger multinationals. Overall, the results are consistent with the main analysis.

The literature review is presented in Section 2. Section 3 describes the methodology. Section 4 provides the data selection process and our sample selection. Section 5 provides the empirical analysis. Section 6 contains a robustness test of our results, and section 7 draws conclusions and suggestions for further research.

2 Literature Review

Multinational enterprises' (MNEs) tax-motivated profit shifting has recently been the subject of extensive discussion among policymakers. Some of the most profitable MNEs pay close to zero income tax on corporate income in their host countries (Fuest et al., 2013). Taxation of MNEs has received renewed public attention after the G7 landed an international agreement in 2021 on a global tax reform requiring MNEs to pay a minimum of 15 per cent tax in each operating country (HMTreasury, 2018). In response to the extensive tax planning strategies, the OECD, in cooperation with G20, created an inclusive framework to bring 141 countries and jurisdictions to collaborate on solving the issue. Similar to the 2008 financial crisis, state ownership increased during the COVID-19 pandemic (OECD, 2021), implying the importance of analysing profit shifting behaviour within SOMNEs.

Corporate income is taxed at different rates worldwide, incentivising MNEs to shift profits to jurisdictions with lower tax rates. Research investigating the scope of profit shifting has faced data and methodological challenges, disabling public scrutiny of MNEs' potential tax avoidance behaviour (Garcia-Bernardo and Janskỳ, 2022). In particular, there exist two main techniques that MNEs use to reduce their tax bills: transfer pricing and debt shifting. The most common way to shift profits is through manipulating transfer prices for international intra-firm transactions between the MNEs' affiliates (Huizinga and Laeven, 2008). Profit shifting by manipulating transfer prices is done by overstating the prices of products imported, and understating the prices of the exports from high-tax countries (Rathke et al., 2020). Consequently, the MNE faces an overall lower tax bill.

Hines and Rice (1994) were some of the first researchers to develop a model for profit shifting, which later became the dominant approach in the literature (Dharmapala and Riedel, 2013) and a common standard in profit shifting research (Dowd et al., 2017). The study uses country-level aggregated data from 1982 for majority-owned US parent firms to regress MNEs' reported profitability on corporate income tax rates. They conclude that the reported profits of US MNEs are sensitive to local tax rates. In addition, they find that firms adjust their use of productivity inputs in response to a change in the local tax rates (Hines and Rice, 1994). Their OLS estimates imply that reported profits are reduced by 3 per cent when the tax rate increases by one percentage point. The study's premise is that the observed profits reported in the affiliate represent the actual profit and the shifted profit of the MNE. Shifted profits are either moved in or out of the affiliate, incentivised by favourable tax rates, while capital and labour inputs in the affiliate generate the actual profit. They found a negative semi-elasticity of the reported profits. The semi-elasticity implies how sensitive the reported profits are to tax differentials between countries where the MNEs operate.

The study of Huizinga and Laeven (2008) is closely related to the study of Hines and Rice (1994), examining European MNEs using data from the Amadeus database provided by Bureau van Dijk. Basing their research on the model of Hines and Rice (1994), they further developed a method to identify profit shifting between affiliates of European MNEs. The study examines profit shifting due to international differences in corporate income tax rates between parent companies and their affiliates and tax differences between the host countries' affiliates. Using cross-sectional data from 1999, they examine the semi-elasticity of MNEs' pre-tax reported profits using a composite tax variable (C-measure). Huizinga and Laeven (2008) developed a measure that incorporates the weighted tax differentials among the MNE's affiliates. Running the regressions, they found an aggregated semi-elasticity of reported profits with respect to the top statutory tax rate of -1.31. Interpreting this point estimate, an increase in the tax differential of 10 percentage points is associated with a decrease by about 13.1 per cent in the country with the top statutory tax rate.

Before 2010, utilising panel and longitudinal data in profit shifting research was not widespread. Increased availability of firm-level data in recent years has made it possible to obtain more credible estimates for MNEs' profit shifting behaviour. Dischinger (2010) conducted a panel study of European MNEs between 1995 and 2005 while controlling for unobserved fixed effects using the Amadeus Database. The regressions return a semi-elasticity of -0.74. If the corporate income tax increases by 10 percentage points, the pre-tax profits are expected to decrease by about 7.4 per cent in the country with the top statutory tax rate.

Lohse and Riedel (2013) use the same database as Huizinga and Laeven (2008), but moves one step further by updating the data from 1995 to 2009, which gives a semi-elasticity of -0.4. Panel data can capture unobservable affiliate characteristics with a fixed effect approach. In their research, they calculate the semi-elasticity of the MNE's profit shifting behaviour by using the average tax difference, in contrast to the sales weighted tax difference used by Huizinga and Laeven (2008). Dharmapala and Riedel (2013) further developed the model by using a difference-in-differences method to account for exogenous industry shocks to identify profit shifting. In addition to transfer pricing and debt shifting, they also examined the third channel of profit shifting: the reallocation of intangible assets to affiliates with the lowest corporate tax rate.

A study of Dowd et al. (2017) explores profit shifting in response to differences in tax rates concerning whether the tax differences occur in a country with high or low taxation. The study's conclusion proves significant evidence that the density of profit shifting is more intense in countries with low corporate taxation. Their study contributes with valuable insight, as the study of Huizinga and Laeven (2008) assumes that the MNE's response to a change in the tax rate is the same in all countries.

More recent research by Heckemeyer and Overesch (2017) compares 27 profit shifting studies by conducting a meta-regression analysis to identify the variation in reported empirical findings in the profit shifting literature. They find that the mean of the semi-elasticities in the studies is -1.52 from a sample of 203 estimates of MNEs' responses to the tax differentials. Further, they find that the magnitude of the estimated semi-elasticities tends to decrease over time. Heckemeyer and Overesch (2017) identified three main reasons for why the identified tax effects might vary. First, the type of endogenous profit variable used in the studies varies, and the scope of the profit shifting it reflects. Secondly, the econometric specification used to calculate the results differ. Lastly, the employed proxy used to calculate the tax incentive differs. Considering the confounding factors and influence of different study designs, Heckemeyer and Overesch (2017) find a semi-elasticity of pre-tax profits of approximately -0.8. The measure implies that if the international tax differential increases by 10 percentage points, the reported profits of the MNE decrease by around 8 per cent.

Due to the lack of financial data on developing economies, most profit shifting research focuses on developed economies. Johannesen et al. (2020) investigate how tax avoidance is more common in less developed countries by using the Orbis database. By studying cross–border profit shifting, the data requirements are lower, solving problems related to data coverage. Their findings from the regressions prove that the level of economic development is negatively related to the sensitivity of profits in terms of profit shifting incentives. The study relates each affiliate's tax incentive, labour and capital inputs to their reported profits, which is the most used empirical strategy to detect profit shifting. Their results indicate that less developed countries are more exposed to tax avoidance by MNEs. The negative relationship between development and tax avoidance is robust, and all development indicators correlate with tax aggressiveness.

Another study examining how exposed developing countries are to profit shifting activities finds that an increase in the country's tax rate affects the country's tax base (Crivelli et al., 2016). The study of Crivelli et al. (2016) finds that decreasing foreign corporate income tax rates also reduces the country's tax base. Developing countries are more vulnerable to profit shifting, as they are more reliant on corporate income tax as a part of their total tax revenue. Moreover, developing economies often collect taxes between 10 and 20 per cent of their GDP, while more developed countries, with higher levels of regulatory quality, tax typically 40 per cent (Besley and Persson, 2014). Countries with lower regulatory quality are associated with lower policy implementation, suggesting lower performance (Curristine et al., 2007).

Corruption in the tax administration imposes a severe threat to the ability of countries to collect taxes from MNEs, both in advanced and developing economies (Baum et al., 2019). Literature suggests that the higher the level of corruption, the more significant the effect of the tax differential on reported profits (Bilicka and Seidel, 2020). Bilicka and Seidel (2020) employed a panel data study on firm-level data, using a corruption weighted tax differential to show that corruption increases profit shifting of European firms. Their findings suggest that countries with otherwise similar tax rates face lower tax revenue elasticities when they are more corrupt. Baum et al. (2019) find similar evidence focusing on SOMNEs, finding that corruption undermines the state-owned enterprises' performance, which imposes a considerable burden on taxpayers.

Profit shifting by SOMNEs is an area of research not receiving much attention in the empirical literature. There is no globally accepted definition for a SOMNE, but the Trans-Pacific Partnership's (TPP) definition is standard (Mathur, 2021). TPP defines a SOMNE as an enterprise where the government directly owns more than 50 per cent of the share capital, exercises more than 50 per cent of the voting rights, or holds the majority of the board members. In addition, the state needs to have a share of the revenue from foreign operations and a share of assets and liabilities attributed to foreign investments. There does not exist a universal framework for governing SOMNEs. Consequently, financial data collection for SOMNEs is challenging, and data required to analyse SOMNEs' profit shifting behaviour is often missing.

SOMNEs are fast-growing in size and number. There are approximately 1500 SOMNEs worldwide, accounting for 1.5 per cent of all multinational enterprises (Estrin et al., 2021). Affiliates within SOMNEs often operate in strategic industries such as utilities, electricity and transportation, which are more technology-intensive industries (Soete, 1991). The tax planning strategies of SOMNEs are an essential field to study as state-owned enterprises account for 10 per cent of the largest enterprises in the world. In response to the COVID-19 pandemic, governments worldwide have increased their equity stake in companies in financial distress, which has led to an increase in state ownership (UNCTAD, 2015). Ownership structure affects the profitability of a MNE, as private enterprises tend to be more profitable than the state-owned (Phi et al., 2019).

The existing empirical literature that has examined SOMNEs' role in the global economy has found that these enterprises have a more significant focus on non-financial objectives than private MNEs (Rygh and Benito, 2021). SOMNEs base investment decisions in foreign countries on different targets than other MNEs, who often seek profitability as their primary objective. Research conducted regarding SOMNEs has concluded that SOMNEs seek to expand their operations to foreign countries to gain influence among global peers(Duanmu, 2014). Comparing MNEs to SOMNEs, the cost-benefit calculations that MNEs conduct as a base for investment decisions are not the calculus of prevailing models used by SOMNEs. In contrast to MNEs, SOMNEs' methods of entering new countries are often riskier and require more significant commitments to allow them to achieve the political objectives of the government.

Existing literature on SOMNEs has compared investment decisions of SOMNEs and other MNEs and concluded that SOMNEs are more likely to invest in projects with lower business value than the projects undertaken by private companies (Duanmu, 2014). Governments' large budgets allow them to undertake more risk and be more patient.

Internalising to reduce the power of the existing government is another objective other than profit maximisation. SOMNEs benefit from political relations between the host and home country, reducing the risk and mitigating the exposure to expropriation risk. Duanmu (2014) finds that state-owned firms benefit from political connections between the host and home country.

The recent study by Hilling et al. (2021) uses panel regressions in the period 2000-2019 for Swedish companies. It establishes that when the standard deviation of state ownership increases by one, corporate tax payments increase by 14 per cent. The study found that tax avoidance is a decreasing function of the level of state ownership, significant at the 10 per cent level. These results are similar to the study by (Bradshaw et al., 2019), which found that increased state ownership reduces the tax avoidance for Chinese firms. As the state is the controlling shareholder of SOMNEs, the enterprises make favourable decisions for the state. The study concludes that managers' promotions in state-owned enterprises are positively related to tax rates, and the managers make favourable tax decisions to the state, the controlling shareholder. In order to incentivise its decisions, the state utilises the SOMNE's career concerns. The study finds that when state-owned enterprises become private, the tax avoidance increases. A recent study on German enterprises also concludes that state ownership is associated with less tax planning (Eberhartinger and Samuel, 2020). However, this is only the case for enterprises where the state benefits from the higher tax payments.

3 Methodology

3.1 Theoretical Background

The theoretical model to motivate our empirical analysis is based on the model proposed by Hines and Rice (1994) and further developed by Huizinga and Laeven (2008). The model considers profit shifting arising from international tax differentials between affiliates and parent firms and tax differentials between the affiliates.

The approach created by Hines and Rice (1994) investigated the profit shifting of American corporations and their affiliates. In contrast, Huizinga and Laeven (2008) applied their approach to European multinationals and their affiliates worldwide. The model considers a representative MNE with a parent p that operates in n countries. The parent owns the majority of the shares in the affiliates located in $i = 1, ..., n$ countries, which are owned directly by the parent.

The MNE can manipulate its transfer prices in the transactions between the affiliates in order to shift profits S_i into country i. B_i represents the actual profits generated by the MNE. Following the model proposed by Hines and Rice (1994), the MNE is proposed with a cost when manipulating transfer prices. For instance, the costs arise when the firm modifies its accounts and adopts new investment patterns to comply with the tax authorities. They assume that the marginal cost of shifting profits rises in proportion to the ratio of the shifted profits to actual profits, given by S_i/B_i with γ as the factor of proportionality. The following equation expresses the total shifting expenses for the MNE in country i:

$$E_i = \frac{\gamma}{2} * \frac{(S_i)^2}{B_i} \tag{3.1}$$

The model assumes that the total shifting expenses, E_i, are tax-deductible. In order to maximise its profits, the MNE will choose a level of profit shifting, S_i, to maximise profits from all global operations. The maximisation problem is given by:

$$L = \sum_{i=1}^{n}(1 - \tau_1)(B_i + S_i - \frac{\gamma}{2} * \frac{(S_i)^2}{B_i}) - \lambda \sum_{i=1}^{n} S_i \tag{3.2}$$

τ_1 represents the tax rate, and λ is the Lagrange multiplier. The model uses the restriction that the total profits shifted by a MNE into its n countries are non-positive:

$$\sum_{i=1}^{n} S_i \leq 0 \tag{3.3}$$

The first-order condition with respect to the profits shifted, S_i, is given by:

$$(1-\tau_1)(1-\gamma\frac{S_i}{B_i})-\lambda=0, i=1,...,n \tag{3.4}$$

The first part of Equation 3.4 illustrates the after-tax, after-marginal shifting cost of additional profits reported in country i. This implies that the marginal value of reported profits should be equalised across the different countries where the MNE operates.

A MNE's incentive to shift profits from the domestic country depends on the tax differential. Therefore, the optimal profit shifting S_i into country i is given by solving the following equation:

$$S_i = \frac{B_i}{\gamma(1-\tau_i)} \frac{\sum_{k\neq i}^{n} \frac{B_k}{(1-\tau_k)}(\tau_k - \tau_i)}{\sum_{k=1}^{n}(\frac{B_k}{(1-\tau_k)}} \tag{3.5}$$

Equation 3.5 illustrates that the optimal profit shifting between the affiliate in country i and country k, is proportional to the true profits generated, B_i, the inverse of γ(1- τ_i) and a weighted average of the effective tax differential, τ_k - τ_i with weights equal to $\frac{\frac{B_k}{(1-\tau_k)}}{\sum_{k=1}^{n}\frac{B_k}{(1-\tau_k)}}$. This weight, as well as the effective tax rates τ_i and τ_k in the term γ(1- τ_i), reflect that shifting costs are considered to be tax deductible in the country where the costs incur. This implies that the tax differential is an important determinant for the profits shifted. In addition, profits generated in country k, B_k, increase the weight on the tax differential, τ_k - τ_i. An interpretation of this is that a larger proportion of the MNE's operations in country k makes it less costly to shift profits with this country.

The reported profits are the sum of the actual profits generated B_i and the profits shifted S_i, denoted B_i^r.

$$B_i^r = B_i[1 - \frac{1}{\gamma(1-\tau_i)} \frac{\sum_{k\neq i}^{n} \frac{B_k}{(1-\tau_k)}(\tau_i - \tau_k)}{\sum_{k=1}^{n}(\frac{B_k}{(1-\tau_k)})}] \tag{3.6}$$

Taking the logs of Equation 3.6 gives the following formula:

$$b_i^r = b_i - \frac{1}{\gamma}C_i \tag{3.7}$$

In this approximation, $b_i^r = \log(B_i^r)$, and $C_i = \frac{1}{(1-\tau_i)} \frac{\sum_{k\neq i}^{n} \frac{B_k}{(1-\tau_k)}(\tau_i - \tau_k)}{\sum_{k=1}^{n}(\frac{B_k}{(1-\tau_k)})}$. The latter is the composite tax variable, which considers the different profit shifting incentives and opportunities. A positive value of C_i implies that the multinational optimally shifts profits out of country i.

In the model developed by Hines and Rice (1994), it was assumed that actual profits are the return to capital where capital, K_i, and labour, L_i, are the only two factors producing output, denoted Q_i. Since the actual profit variable B_i is not directly observable, the model assumes the Cobb-Douglas production function. This function is given by $Q_i = cA_i^{\varepsilon}L_i^{\alpha}K_i^{\varphi}e^u$. In this function, variable A_i is the productivity parameter, reflecting differences in technology between different countries. u_i is the random term. The actual profits generated, B_i, is equal to the output minus the wage paid as compensation to the workforce, which implies that $B_i = Q_i$ - w_iL_i. The wage paid, w_i, is assumed to be equal to the marginal product of labour, expressed by $c\alpha A_i^{\varepsilon}L_i^{1-\alpha}K_i^{\varphi}e^u$. The actual profits B_i can be expressed by $c(1-\alpha)A_i^{\varepsilon}L_i^{\alpha}K_i^{\varphi}e^u$.

When taking the logs of $B_i = c(1-\alpha)A_i^{\varepsilon}L_i^{\alpha}K_i^{\varphi}e^u$, b_i is expressed by

$$b_i = log(c) + log(1-\alpha) + \varepsilon a_i + \alpha l_i + \varphi k_i + u_i \tag{3.8}$$

In Equation 3.9 $a_i = \log A_i$, $l = \log\ L_i$ and $k_i = \log(K_i)$. When substituting the expression for b_i into Equation 3.8 , b_i^r is expressed in the following way:

$$b_i^r = \beta_1 + \beta_2 a_i + \beta_3 l_i + \beta_4 k_i - \hat{\gamma}C_i + u_i \tag{3.9}$$

In Equation 3.9 $\beta_1 = \log(c) + \log(1\text{-}\alpha)$, $\beta_2 {=} \varepsilon$, $\beta_3 = \alpha$, $\beta_4 {=}\ \varphi$, $\hat{\gamma} = \frac{1}{\gamma}$. An interpretation of the equation is that the logarithm of reported profits, b_i^r, responds negatively to the composite tax variable C_i.

The estimated factor of proportionality, $\hat{\gamma}$, can be interpreted as the semi-elasticity of reported profits B_i^r with respect to the composite tax variable, C_i. $\hat{\gamma}$ is given by $-\frac{1}{B_i^r}\frac{dB_i^r}{dC_i}$.

Considering the expression of the composite tax variable, tax authorities can affect C_i, and reported profits B_i^r through the tax rates τ_i. The elasticity of B_i^r with respect to the tax rates τ_i is given by $-\frac{1}{B_i^r}\frac{dB_i^r}{d\tau_i} = \hat{\gamma}\frac{dC_i}{d\tau_i} > 0$, simultaneously as the tax rate changes in country k is different from i, $-\frac{1}{B_i^r}\frac{dB_i^r}{d\tau_k} = \hat{\gamma}\frac{dC_i}{d\tau_k} < 0$.

3.2 Investigation Strategy

Most studies provide indirect evidence of profit shifting. Only a few papers have provided direct evidence by using affiliate-level data on intra-firm transfer prices (Dischinger, 2010). Hence, we will base the investigation strategy on an indirect approach using EBIT as the dependent variable. Our investigation strategy uses a panel from 2013 to 2020 on affiliates within a multinational corporation.

Because of the increasing availability of affiliate-level longitudinal data, panel data techniques can control for unobserved affiliate heterogeneity and time-varying firm, industry and host-country characteristics. Our empirical strategy follows previous literature, which relates reported profits to its inputs of labour and capital, and the tax incentive to shift profits from one affiliate to another (Huizinga and Laeven, 2008). However, in terms of model variables, our baseline specification deviates from the baseline model developed by Huizinga and Laeven (2008) because of data unavailability for the cost of employees and missing affiliate data. The first part of the analysis represents a minimal model using the main explanatory variables from Equation 3.9 except for labour. In addition, an interaction term is included to identify affiliates of SOMNEs and their effect on the tax differential, with the tax differential of affiliates of other MNEs as the control group. The first estimation model is represented with Equation 3.10:

$$\begin{aligned} log(EBIT_{it}) = \beta_0 + \beta_1 GDP_{it} + \beta_2 Capital_{it} + \hat{\gamma} taxdiff_{it} + \beta_3 StateOwned * taxdiff_{it} \\ + \beta_x X_{it} + \varepsilon_{it} \quad (3.10) \end{aligned}$$

The estimation equation represents the logarithm of EBIT, $EBIT_{it}$ of affiliate i. The GDP_{it} variable is proxied by the logarithm of GDP per capita. $Capital_{it}$ is the capital of affiliate i, which is proxied by the log of fixed assets. The $taxdiff_{it}$ variable represents the difference between an affiliate's tax rate and the tax rates of each of the other majority-owned entities within the same multinational, divided by the number of identified affiliates within the multinational. The interaction term consists of the dummy $StateOwned$ equal to 1 if the affiliate operates within a multinational majority-owned by the state or public authorities, and 0 otherwise, multiplied by the tax differential. Moreover, X_{it} is the vector of time-varying country characteristics included in the regression to control for heterogeneity across different countries. In order to account for industry heterogeneity across time, we use industry dummies to absorb all common shocks to affiliates operating within the same industry over time. u_i is the error term, and β_0 is the intercept.

Our estimation strategy aims to expand the baseline model with more dimensions to categorise the observations from our sample after their host country characteristics. Firstly, we want to investigate profit shifting behaviour in developed and developing countries, where heterogeneity exists across industries and country-specific characteristics. Secondly, few empirical papers focus on examining the possible profit shifting behaviour of SOMNEs. Because SOMNEs operate in the same marketplace as private multinationals, they should be subjected to similar rules on transparency in terms of data availability as multinationals with a different ownership structure. The objectives of SOMNEs might differ from that of other multinationals, as affiliates within a SOMNE might have multiple objectives other than profit maximisation (Prabowo et al., 2018). Because of these possible differences, we want to investigate whether there are deviations between the affiliates with a different ownership structure regarding profit shifting behaviour.

In order to capture how the tax incentive differs across different types of countries, our estimation strategy follows previous literature dividing the sample into different categories. Consistent with the literature provided by Johannesen et al. (2020), the second estimation strategy divides the sample into categories based on their level of development. Firstly, the specification includes a dummy variable, equal to 1 if the country is above a certain percentile and 0 if the country is within the percentile. Secondly, an interaction term is included, which multiplies the dummy with the tax differential. This interaction term interprets the effect of relatively higher development on the tax differential. In order to investigate the different levels of development, we divide the sample after the 25th, 50th and 75th percentile based on the host country's GNI. Equation 3.11 represents the second estimation model:

$$
\begin{aligned}
log(EBIT_{it}) = \beta_0 + \beta_1 GDP_{it} + \beta_2 Capital_{it} + \hat{\gamma} taxdiff_{it} + \beta_3 StateOwned * taxdiff_{it} \\
+ \beta_4 Developmentit + \beta_5 Develooment_{it} * taxdiff_{it} + \beta_x X_{it} + \varepsilon_{it} \quad (3.11)
\end{aligned}
$$

An extended baseline model includes four categories that divide the sample into quantiles to model the distribution's different tails. Similar to the previous specification, GNI categorises the sample. The first category is our control group, including observations from the first to the third and tenth quantile. The second category includes observations from the fourth to the sixth quantile. The third includes observations from the seventh to the eighth quantile. Lastly, the fourth category includes observations from the ninth quantile. An interaction term is included by multiplying the dummy with the tax differential for each category. Equation 3.12 represents the third estimation model:

$$
\begin{aligned}
log(EBIT_{it}) = \beta_0 + \beta_1 GDP_{it} + \beta_2 Capital_{it} + \hat{\gamma} taxdiff_{it} + \beta_3 StateOwned * taxdiff_{it} + \\
\beta_4 Category2 + \beta_5 Category2 * taxdiff_{it} + \beta_6 Category3 + \beta_7 Category3 * taxdiff_{it} \\
+ \beta_8 Category4 + \beta_9 Category4 * taxdiff_{it} + X_{it} + \varepsilon_{it} \quad (3.12)
\end{aligned}
$$

We want to investigate whether the level of development of a country determines the response to a change in the tax differential. Therefore, the previous specifications, Equation 3.11 and 3.11, are applied with different categorisations as alternative measures of the economic development of a country. Different world governance indicators such as control of corruption, regulatory quality, government effectiveness and unemployment divide the sample into new categories.

4 Data

4.1 Firm and Country Specific Data

The firm-level data is collected from the Orbis database, provided by Bureau Van Dijk, offering information on more than 40 million multinational firms. The database combines both firms' financial statements, actual sales and employment. In addition, the availability of ownership information makes it possible to match firms with their subsidiaries (Kalemli-Ozcan et al., 2015).

Since we are interested in researching differences in international profit shifting within SOMNEs and multinationals without state ownership, the observational units are subsidiaries of these firms. In the Orbis database, a multinational firm represents a firm with a controlling interest in at least one foreign subsidiary, either directly or indirectly. Furthermore, a subsidiary represents a firm in which the parent owns at least 50.01 per cent of the total shares. When a state or public authority is a majority owner of a multinational firm, it is considered a SOMNE. Although there is no globally accepted definition for a SOMNE, the Trans-Pacific Partnership's (TPP) definition is standard (Mathur, 2021), see Section 2. Following this standard, the definition used in this thesis is that a SOMNE is a state-owned firm with a share of at least 50.01 per cent in a foreign subsidiary and a controlling interest in at least one foreign subsidiary.

In the profit shifting literature, researchers use statutory tax rates as the correct tax rate, in contrast to other tax rates that are more industry-specific. Previous literature has focused on statutory tax rates as each firm creates a tax base based on its profit shifting activities. Moreover, different tax jurisdictions operate with different complexity, making it difficult to adjust the data accordingly. Consistent with previous literature, we will use statutory tax rates collected through the KPMG website (KPMG, 2021). See Appendix A1.3 for an overview of tax rate data.

Country-level data on the gross domestic product (GDP) per capita is obtained from the World Bank database (Bank, 2021). The country-specific data on corruption control, government effectiveness and regulatory quality are obtained from the World Bank database (WB, 2020). Data on the unemployment rate of each country is collected from the World Bank database, reporting the calculated unemployment as the total per cent of the unemployed labour force.

Similarly to the other country-specific data, data on the GNI is collected from the World Bank database (WB, 2021). This indicator includes the purchasing power parity (PPP) to enable comparisons based on an international benchmark, as the measure reflects people's living standards comparably across countries. Using PPP, which converts the data into a common currency, makes it possible to compare economic statistics across countries, making GNI PPP a suitable measure for development (UNDP, 2020).

4.2 Sample Selection

Using the Orbis database, we obtained historical ownership information on SOMNEs and their foreign subsidiaries and information on multinationals without state ownership and their foreign subsidiaries. Following the sample restriction method proposed by Huizinga and Laeven (2008), we selected options in Orbis and trimmed the data to follow their approach.

We restricted the main data to consider firms from 2013 to 2020, represented by Table 4.1. Multinational firms tend to obtain both consolidated and unconsolidated statements. The unconsolidated statements reflect the activities between the parent firm and its subsidiaries. The option to choose unconsolidated statements in Orbis allows us to obtain separate statements on the subsidiaries of the concerned firm, consistent with the restriction method by Huizinga and Laeven (2008). Moreover, to conduct the analysis, we require the firms to report basic accounting information such as EBIT, sales and fixed assets. This accounting data is necessary to construct the variables used in the empirical analysis. Orbis converts the data into US Dollars, making the data comparable in currency.

To begin with, we obtained data on MNEs without state ownership, illustrated in Table 4.1. After restricting the sample to include all firms except SOMNEs, the sample decreased from 310.241.099 active firms to 58.925.136 firms. Firstly, to only include shareholders with foreign subsidiaries, the dataset was restricted to only include firms with this characteristic, reducing the sample to 765.528 firms. Secondly, to gain information on the subsidiaries, we obtained the BvD ID number of each subsidiary. Generating a random sample of 10.000 parent firms, Orbis provided data on 37.296 subsidiaries located in a different country than the parent. In order to download the data - we use the options in Orbis to remove subsidiaries with missing information on EBIT and sales.

Similarly to the data on multinationals without state ownership, the primary data sample consists of 310.241.099 active companies. Table 4.2 presents the data on SOMNEs. After restricting the sample to include only subsidiaries with state-owned shareholders, the sample dropped to 255.990 state-owned enterprises. When adding the restriction to only include shareholders with foreign subsidiaries, the final sample of parent firms decreased to 2.716 firms. In order to find data on foreign subsidiaries, we extracted the BvD ID number of each foreign subsidiary. Since Orbis reports on subsidiary information directly in the available last year, we used the BvD ID numbers to retrieve yearly information on the foreign subsidiaries in Orbis, providing information on 13.292 subsidiaries.

In order to avoid duplicates and double counting of observations, we removed subsidiaries with more than one majority shareholder, considering that we are not able to identify the parent firm. Furthermore, firms with missing values on our required variables were removed from the sample, reducing the sample of foreign subsidiaries. Moreover, loss-making subsidiaries were removed from the sample, which is customary in the profit shifting literature. All variables besides the tax difference variable are transformed in the logarithmic form to mitigate the potential effect of outlier observations, further reducing the sample size of subsidiaries as all non-positive variables are removed.

Table 4.1 and 4.2 reports the sample selection of subsidiary-year observations. The sampling selection in step 1 is the same for each year and subsidiary. Steps 2.5 - 2.7 are the same for all years in Table 4.1, and steps 2.4 - 2.5 are the same for all years in Table 4.2. The dataset was drawn from the database in April 2022, providing information on the subsidiary BvD ID numbers from the available last year. An implication with Orbis is that ownership information and available accounting information varies between 2013 and 2020, resulting in varying subsidiary observations for each year. The number of subsidiaries included in the final sample is reported in steps 2.8 and 2.9 in Table 4.1 and 2.6 and 2.7 in Table 4.2. The total sample is the sum of the subsidiaries from 2.9 and 2.7 from Table 4.1 and 4.2 respectively.

Table 4.1: Sample Selection MNEs

Not State-Owned Enterprises

Steps	
Step 1 - Parents	Observations
1. Affiliate-year observations	310.241.099
2. Affiliates with state-ownership > 50.01 per cent	58.925.136
3. Shareholders with foreign affiliates	765.528
4. Generating a random sample of 10.000 affiliates	10.000
Step 2 - Subsidiaries	Observations
5. Extracting BvDID numbers of majority owned subsidiaries*	37.296
6. Removing subsidiaries with missing EBIT and Sales	9.202
7. Removing subsidiaries with parent companies in two or more countries**	5.837
8. Removing subsidiaries with zero, negative or missing EBIT	
2020	3266
2019	3665
2018	3649
2017	3440
2016	3222
2015	2994
2014	2827
2013	2610
9. Dropping observations with missing values and lacking financial data	
2020	2920
2019	3228
2018	3245
2017	3133
2016	2924
2015	2742
2014	2590
2013	2406
Total sample	23.213

** Obtrived from 10 000 randomly distributed firms*
*** Orbis error*

Table 4.2: Sample Selection SOMNEs

State-Owned Enterprises

Steps	
Step 1 - Parents	Observations
1. Affiliate-year observations	310.241.099
2. Affiliates with state-ownership > 50.01 per cent	255.990
3. Shareholders with foreign subsidiaries	2716
Step 2 - Subsidiaries	Observations
4. Extracting BvDID numbers of majority owned subsidiaries	13.292
5. Removing subsidiaries with more than one parent*	4.662
6. Removing subsidiaries with zero, negative or missing EBIT	
2020	412
2019	499
2018	497
2017	467
2016	479
2015	413
2014	413
2013	380
7. Dropping observations with missing values and lacking financial data	
2020	158
2019	185
2018	203
2017	205
2016	224
2015	225
2014	240
2013	212
Total sample	1652

**Orbis Error*

4.3 Model Variables

The baseline model is expressed by the log of EBIT as the dependent variable, explained by GDP per capita, capital and the tax difference variable. The unconsolidated EBIT as the regressand includes the interest payments of the firm, which in contrast to earnings before tax (EBT), does not capture the strategic use of debt (Dharmapala and Riedel, 2013). We employ EBIT as the dependent variable, as it captures possible manipulations of transfer prices, consistent with the study of Huizinga and Laeven (2008).

The explanatory variable *GDP* is proxied by GDP per capita and transformed to logarithmic form. The variable is a proxy of a in the Cobb-Douglas production function, which is the productivity parameter. This parameter reflects differences in technology between different countries.

Furthermore, *Capital* is proxied by the log of fixed assets, which is used on the assumption that transfer prices on fixed assets are more easily assessed compared to intangible assets.

The composite tax variable, C, is constructed as an average of bilateral tax differences weighted by sales, used as a proxy for the true tax base, B. The interpretation of this variable is that multinationals with establishments in low-tax countries register relatively low sales as low-tax countries tend to be small countries with smaller market sizes compared to larger countries (Huizinga and Laeven, 2008). Because of missing values on affiliates within a multinational and lack of accounting data, we do not know the true profit of the multinational. This measurement error creates a problem if the multinational has affiliates in tax havens with no accounting information. Our study will estimate an average tax differential as the appropriate measure of profit shifting incentives and opportunities and conduct robustness checks of alternative approaches. The tax differential measure in our model builds on supplementing literature by Lohse and Riedel (2013), calculating the tax differential by taking the difference between the host country's statutory tax rate and the unweighted average tax rate of other majority-owned affiliates within the multinational. The new approach enables the calculation of the tax differential measure not to be weighted by sales.

GNI adjusted for the purchasing power parity is included in the panel data study to measure a country's development. This indicator ranges from USD 4800 for the least developed countries to a maximum value of USD 90.320 for the most developed countries in our sample (WB, 2021). An alternative development measure is the human development index (HDI), which emphasises that people and their capabilities should be the ultimate criteria for assessing development rather than only economic growth (UNDP, 2021). However, this measure does not provide updated data for 2020, which might bias our estimates. Therefore, GNI is the appropriate developmen measure in our baseline model.

In order to analyse alternative explanations for differences between countries, several national indicators are included as proxies of the development of a country.

Firstly, the control of corruption indicator is included to categorise the host countries after their perceived level of corruption. The indicator captures to what extent public power is used for private gain (Kaufmann et al., 2011). The indicator ranges from 0 (least corrupt) to 100 (most corrupt) and captures the views of many citizens, experts and enterprise survey respondents (Bilicka and Seidel, 2020). The advantage of this indicator compared to other similar corruption indicators is that the control of corruption is drawn on more data sources and, therefore, less likely to be biased by the perception of experts (Kaufmann et al., 2011). However, a limitation of using this indicator is the many dimensions incorporated which may capture other forms of corruption other than corruption related to taxes. However, by assuming that corruption is a systematic phenomenon, a change in one type of corruption usually will change in another.

Secondly, the regulatory quality indicator is included, ranging from -2.5 (lowest quality) to 2.5 (highest quality) (Kaufmann et al., 2011). The indicator captures each country's ability to implement and formulate sound policies and regulations, to promote and permit development in the private sector.

Thirdly, the level of unemployment describes the economic situation in a country and can therefore be a proxy for development. Previous studies have suggested that high unemployment rates seem to attract European investors. In contrast, non-European MNEs seem to be attracted by high wages, skilled workers and strategic assets (Basile et al., 2008). Categorising the sample after the unemployment rate of the host country could therefore describe differences in the incentives to shift profits.

Lastly, another alternative to GNI is the government effectiveness indicator, ranging from

-2.5 (least effective) to 2.5 (most effective) (Kaufmann et al., 2011). The World Bank bases this indicator on civil service independence from political pressure and the country's quality of policy implementation and government credibility (WB, 2021).

4.4 Descriptive Statistics

The final sample consists of 24.865 affiliate-year observations of 23.213 affiliates of MNEs and 1.652 affiliates of SOMNEs. The affiliates have locations in 65 different host countries, identified by their country ISO code. Approximately 89 per cent of the sample is subsidiaries located in Eastern and Western Europe. The Far East and Central Asia is the most represented World region outside Europe, with 8.09 per cent of the sample located in this world region. Affiliates per world region is presented in Appendix A1.6. Many MNEs have only one foreign subsidiary in terms of the number of subsidiaries within each MNE.

The number of affiliates per MNE is presented in Appendix A1.7. This type accounts for 40 per cent of the total sample. For the other MNEs, the number of subsidiaries ranges from 2 to 104. Moreover, the panel is unbalanced because of limitations such as the strict restrictions made in the sample selection and the absence of available data, with varying observations each year. The number of observations increases by the year, with fewer observations in 2013 compared to 2018. However, in 2020 the number of observations decreases because of diminishing data availability. Figure 4.1 presents the summary statistics of our final sample.

Some differences exist in the industries where SOMNEs are present compared to other MNEs, as presented in Appendix A1.5. The majority of affiliates within a SOMNE operate within the electricity industry (29.84 per cent) and transportation (23.73 per cent). On the contrary, affiliates within other MNEs operate mainly in wholesale and retail (33.14 per cent) and the manufacturing industry (25.07 per cent). In contrast to MNEs without state ownership, SOMNEs are often present in countries with higher governance and operate within utilities and transportation. In these types of industries, there is usually a more substantial reason for intervention (IMF, 2020).

Figure 4.1: Number of Affiliates by Year

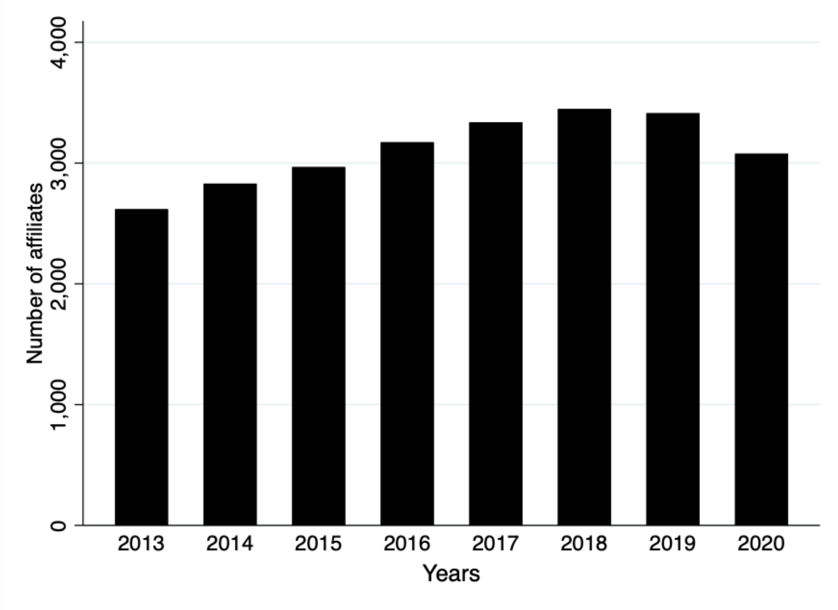


Table 4.3 provides summary statistics for the firm-level variables and the country-specific variables for all subsidiaries in our sample. The table includes the mean, the standard deviation (SD), the median, and the maximum and minimum values of each variable. See Appendix A1.1 for the extended summary statistics.

Table 4.3: Summary Statistics

	Mean	SD	Median	Min	Max	N
Firm characteristics						
logEBIT	6.18	2.25	6.20	0	16.45	24865
Capital	6.87	3.10	6.92	0	18.26	24865
Tax difference	-6.67e-12	0.033	0	-0.25	0.225	24865
Number of affiliates	8.28	17.86	2	1	104	24865
Country characteristics						
logGDP	10.01	0.80	10.16	7.28	11.72	24865
CIT	0.23	0.062	0.22	0	0.55	24865

Note: *The table provides summary statistics on the mean, the standard deviation (SD), the median, and the minimum and maximum value of each variable, categorised by the firm and country characteristics. The sample consists of international firm data collected for 2013-2020. LogEBIT is the logarithm of earnings before interest and taxes. Capital is the logarithm of fixed assets. Tax differential is the difference between the tax rate of an affiliate and the tax rate of the other majority-owned affiliates within the same MNE, divided by the total number of identified affiliates within the MNE. The number of affiliates is the number of foreign affiliates within a MNE. LogGDP is the logarithm of GDP per capita. CIT is the statutory tax rate of the host country.*

The descriptive statistics on country-specific variables return a mean CIT of approximately 23 per cent, ranging from a minimum tax rate of zero to a maximum tax rate of 55 per cent. The lowest tax rate, zero, is found in the Bahamas, while the United Arab Emirates reports the highest statutory tax rate in our sample (KPMG, 2021). Appendix A1.3 provides an overview of the tax rates per country over the period.

Appendix A1.4 provides the correlation matrix. The logarithm of EBIT is positively related to capital, the tax differential and GDP per capita. The latter correlation suggests that MNEs economise on inputs and reported income in high-tax countries (Huizinga and Laeven, 2008). The finding of this correlation supports that individuals living in countries with higher incomes have higher real wages, which might imply higher reported income and consumption. Lastly, the tax differential is positively related to GDP per capita, suggesting that high-income countries have higher statutory tax rates.

4.5 Limitations

The sampling method and the requirements on model variables create several limitations in terms of the theoretical framework used. Huizinga and Laeven (2008) propose a log transformation of several variables to remove non-profitable affiliates from the sample. The rationale behind this restriction is that we want to study profitable affiliates in which incentives are most likely to be relevant. Moreover, the log transformation mitigates the potential effect of outliers. Because of this restriction, the sample size is reduced and might bias our results if the removed affiliates are subject to profit shifting.

Furthermore, a limitation to our analysis is the tax measure. The weighted C-measure introduced in the theoretical framework has a standard deviation sensitive to the number of affiliates included in the MNE. Because of strict sampling restrictions, some affiliates are missing from the final sample. The appropriate measure used in this thesis is a tax differential calculated by taking the difference between all majority-owned affiliates within a MNE and dividing this by the total number of identified affiliates within the MNE.

In addition, the database used to gather information has its limitations, which also propose additional limits on our estimations. The Orbis database is not nationally representative due to how the data is delivered and the restrictions made to download the data. Even though most countries are required to register information about primary financial accounting data, reporting requirements vary between different countries. The database has different covering across firms operating in different countries, with some economies being comparably poorly represented (Fuest et al., 2013). In terms of model variables such as earnings before tax (EBT) and cost of employees, firms in developing countries are poorly represented in terms of reporting on these financial measures. As a result, there might be a bias towards firms in more developed countries and larger firms, in which the coverage is often more complete. In order to mitigate these limitations, the variables included in our regressions are based on standard accounting information in which data is available for both European and non-European affiliates. However, this implies an exclusion of other important variables, such as the cost of employees and EBT. These variables might explain variation in the dependent variable, and the exclusion might propose an omitted variable bias.

Another issue using the Orbis database is that firms will be missing in a longitudinal sense because Orbis drops firms without reported information after a certain period (Kalemli-Ozcan et al., 2015). Missing affiliates which might be part of a MNE might introduce noise into the analysis. In the Orbis database, we downloaded data in April 2022. Thus, the ownership information reflects information from this point in time. This restriction implies that if the ownership structure has changed between 2013-2020, some missing financial information or ownership information might limit the data sample. The same problem exists if the MNE has affiliates located in a country considered a typical tax haven, where the tax avoidance does not leave any traces in accounting data, making it difficult to obtain an ownership linkage.

Overall, the theoretical framework and the data sampling requirements imply that the study's gross sample is much smaller than the total number of firms available in the Orbis database. However, the obtained data might contribute to the literature to better understand SOMNEs and affiliates within developing countries. Despite its limitations, the Orbis database remains a vital data source because of its availability of unconsolidated accounting information on firms operating in different economies and with different ownership structures.

5 Empirical Analysis

5.1 Baseline Model

The panel data analysis is done on affiliate-year observations for 2013 to 2020 while controlling for unobservable time-specific effects common to all affiliates and countries in a given year. Dummy variables for each NACE code are included as industry fixed effects to absorb sector heterogeneity. Moreover, the inclusion of a set of dummy variables to account for the different host countries in our sample account for time-invariant unobserved heterogeneity between countries. We report White's heteroskedasticity consistent standard errors (White, 1980), which is consistent with the research of Huizinga and Laeven (2008). Clustering corrects for the robust standard errors at the multinational firm level, which is consistent with literature applying data on affiliate-year observations (Johannesen et al., 2020; Lohse and Riedel, 2013; Dowd et al., 2017).

Table 5.1 demonstrates our main regression results. Columns (1) and (2) follow the estimation approach corresponding to Equation 3.10, including our main explanatory variables and an interaction term with a dummy equal to 1 if the affiliate is within a SOMNE multiplied by the tax differential. The dependent variable is the log of EBIT. Column (1) is the specification in the baseline model without industry-year fixed effects. By including fixed industry-year effects in the regression in column (2), the semi-elasticity changes from -0.119 to 0.116. The positive point estimate in (2) is inconsistent with previous literature on profit shifting applying panel data suggesting a negative semi-elasticity (Dischinger, 2010). With the inclusion of the interaction term with the state-owned dummy and the tax differential, the semi-elasticity increases to 0.716 (0.116 + 0.600). The tax differential and the interaction term are not statistically different from zero, and we can not draw an inference on a significant difference between the effect of SOMNEs and other MNEs. Moving from column (1) to (2), the log of GDP becomes insignificant, implying that there is not enough heterogeneity across the entities in terms of GDP per capita across time.

Furthermore, the baseline specification is applied with additional categorisations to investigate the differences between developing and developed countries.

Table 5.1: Baseline Model: Panel Data 2013-2020

	(1)	(2)	(3) >25th	(4) >50th	(5) >75th	(6) Categories
Capital	0.153***	0.147***	0.147***	0.147***	0.147***	0.147***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
logGDP	0.408***	-0.658	-0.658	0.769	-0.659	-0.658
	(0.142)	(0.759)	(0.759)	(1.058)	(0.759)	(0.759)
Tax differential	-0.119	0.116	-0.087	-0.516	0.020	0.167
	(0.512)	(0.648)	(0.982)	(0.754)	(0.675)	(0.815)
State-Owned * taxdiff	-0.158	0.600	0.568	0.553	0.516	0.543
	(1.510)	(1.301)	(1.292)	(1.443)	(1.342)	(1.322)
Development (GNI)			-5.671***	-1.772***	1.826***	
			(0.383)	(0.375)	(0.318)	
Development (GNI) * taxdiff			0.282	1.645*	0.625	
			(0.952)	(0.930)	(1.137)	
Category 2						0.041
						(0.397)
Category 2 * taxdiff						-0.127
						(0.840)
Category 3						0.997*
						(0.514)
Category 3 * taxdiff						-0.426
						(1.137)
Category 4						-1.945***
						(0.705)
Category 4 * taxdiff						1.005
						(1.153)
N	24865	24865	24865	24865	24865	24865
r2	0.051	0.078	0.078	0.078	0.078	0.078
ρ	0.828	0.852	0.955	0.852	0.838	0.850
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	Yes	Yes	Yes	Yes	Yes

Note:*The table reports the panel data estimation of affiliate-year observations from 2013 to 2020 with fixed industry and country effects. The dependent variable is the logarithm of EBIT. Capital is the logarithm of fixed assets. LogGDP is the logarithm of GDP per capita. Tax difference is the difference between the tax rate of an affiliate and the tax rate of the other majority-owned affiliates within the same MNE, divided by the identified total number of affiliates within the same MNE. All regressions include an interaction term between a dummy variable for observations within a SOMNE and the tax differential variable. Columns (1)-(2) report the baseline model, the first without industry fixed effects and the second with industry fixed effects, represented by Equation 3.10. Columns (3)-(5) are extensions of the baseline model, represented by Equation 3.11. These regressions include a dummy for observations above the 25th, 50th and 75th percentile, respectively, divided by GNI. In addition, an interaction term with the dummy multiplied by the tax differential is included. Column (6) separates GNI into four categories based on pre-defined quantiles, including dummies and separate interaction terms with the tax differential, represented by 3.12. Standard errors are clustered at the group level and reported in the parenthesis. ***, **, * respectively denotes 1, 5 and 10 per cent significance-level.*

To investigate whether a country's level of development is related to the level of profit shifting, we expand the model by adding a dummy variable for development over a certain percentile in columns (3), (4) and (5), and interaction terms which multiplies these dummies with the tax differential. This specification corresponds to Equation 3.11.

The dummy variable in column (3) includes affiliates operating in host countries with a GNI per capita above the 25th percentile. By interpreting the output, we observe that the point estimate of the dummy variable is significant at the 1 per cent level and negative, indicating that reported EBIT is lower for affiliates operating in host countries above the 25th percentile, all else equal. This finding might suggest that affiliates operating within host countries with higher scores on GNI operate in markets with higher competition, which pushes profits down. With the inclusion of the interaction term, the positive coefficient implies that all else equal, countries that are relatively more developed have a semi-elasticity of 0.195 (-0.087 + 0.282). In contrast, the relatively less developed countries (within the 25th percentile) have a semi-elasticity of -0.087. These findings are somewhat contrary to previous literature regressing the tax differential on EBIT, suggesting a semi-elasticity of -1.427 (Lohse and Riedel, 2013). However, since the semi-elasticity is not significantly different from zero, we cannot identify a true relationship between the tax differential and reported EBIT. With the inclusion of the interaction term, indicating whether the affiliate is within a SOMNE multiplied by the tax differential, the semi-elasticity increases by 0.568. This point estimate is not significantly different from zero, and we cannot identify a significant difference between the incentive of SOMNES and that of other MNEs.

The regression output from column (4) expands the control group to include all affiliates operating in host countries within the 50th percentile. This control group includes a relatively larger part of the sample, and the point estimate of the semi-elasticity is -0.516, which is not significantly different from zero. Similar to the output from column (3), the inclusion of the affiliates operating above the 50th percentile implies a lower reported EBIT, all else equal. The coefficient estimate is significant at the 1 per cent level. By adding an interaction term between the tax differential and the development dummy, the semi-elasticity becomes statistically significant at the 10 per cent level with a semi-elasticity of 1.129 (-0.516+1.645). Finding a positive semi-elasticity suggests that the affiliates in host countries with higher GNI are less responsive to a change in the tax differential regarding profit shifting behaviour. Similarly to the other specifications, state ownership increases the semi-elasticity by 0.553. This point estimate is not significantly different from zero.

Column (5) includes a control group of all observations within the 75th percentile. The semi-elasticity for this control group is 0.020, not significantly different from zero. Furthermore, the inclusion of countries with a GNI above the 75th percentile of the sample suggests that affiliates operating in these host countries report a higher EBIT, all else equal. This suggests that profits increase with general economic development. Moreover, the interaction term between the tax differential and development suggests that the inclusion of the highest developed countries increases the tax sensitivity by 0.625, on average. Lastly, the state-owned effect on the tax differential is 0.516; however not significantly different from zero.

The output in column (6) separates the sample into four categories based on their GNI per capita score, replicating Equation 3.12. The dummies separate the observations by the different pre-defined quantiles. Due to relatively few observations on affiliates with host countries defined as developing, we choose not to include more categories, providing the analysis with less narrow groups.

By interpreting the results in column (6), we observe that the semi-elasticity is positive for the control group, equal to 0.167. When including countries within Category 2 and Category 3, the semi-elasticity decreases by -0.127 and -0.426, respectively. Moreover, the inclusion of Category 4 increases the semi-elasticity by 1.005. These interaction terms are not significantly different from zero. Inclusion of the second category dummy increases EBIT, all else equal. This point estimate is significant at the 10 per cent level, suggesting that affiliates located in these countries profit from the higher development of the country and that profits increase with general development.

On the contrary, the inclusion of firms operating within the 90th percentile suggests that the inclusion of affiliates within countries with relatively higher development reduces the reported EBIT. This finding is contrary to that of column (5). However, this finding might imply that affiliates within this category operate in relatively more competitive markets, driving profits downwards. This finding is significant at the 1 per cent level.

The tax differential has a negative semi-elasticity for affiliates operating in host countries within the 50th percentile. Previous literature on developing economies and the effect of the tax differential on profits finds evidence that the sensitivity of reported profits towards profit shifting behaviour is negatively related to the level of development (Johannesen et al., 2020). Finding a relatively more negative semi-elasticity for affiliates within countries with relatively lower development supports this effect. This finding is, however, not significantly different from zero. Furthermore, including relatively higher developed countries increases the semi-elasticity. The finding of a positive semi-elasticity differs from the point estimates from column (6). In this last specification, the semi-elasticity is negative for affiliates within the 4-6th quantile and 7-8th quantile, which are host countries with relatively higher development. However, since the values are not significantly different from zero, we cannot identify a true relationship between the tax differential and EBIT.

Including the interaction term between affiliates within a SOMNE and the tax differential, the point estimate becomes positive for regressions in columns (2) to (6). Few empirical papers examine the relationship between SOMNEs and profit shifting behaviour, and a comparison basis for our estimates related to SOMNEs is deficient. However, the findings might suggest that affiliates within SOMNEs respond differently to a change in the tax differential than other MNEs due to the positive point estimate. MNEs' methods of entering countries are often riskier and require more extensive commitments to allow them to achieve political objectives and gain influence compared to other MNEs (Duanmu, 2014). Because of these differences, SOMNEs might have different objectives compared to other MNEs, which often weigh profit maximisation higher than other objectives (Rygh and Benito, 2021). In other words, reducing the tax rate in one of the countries the multinational operates in might not incentivise SOMNEs to shift profits to the same extent as other MNEs, due to political objectives being prioritized rather than profit maximisation objectives. However, since the point estimates of the semi-elasticity are insignificant, we cannot infer a significant difference between SOMNEs and other MNEs in their incentives to shift profits.

In conclusion, the baseline model fails to identify a true relationship between the tax differential and reported EBIT. We want to investigate whether the level of development of a country determines the response to a change in the tax differential. Furthermore, we want to investigate whether this response differs for MNEs where the state is the majority owner. Lower levels of income in developing countries are often associated with lower quality of governance measured by corruption, government effectiveness, regulatory quality and other governance indicators (Johannesen et al., 2020). Because of these relations, we want to analyse alternative categorisations as proxies for the country's development. In the extended analysis, we employ socio-political factors such as control of corruption, regulatory quality, unemployment and government effectiveness to investigate our research question further.

5.2 Control of Corruption

The control of corruption indicator captures perceptions of the extent to which public power is exercised for private gain (Kaufmann et al., 2011). Corruption is an important political factor that SOMNEs need to consider when operating across borders. As corruption in the tax administration imposes a severe threat to the ability of countries to collect taxes from MNEs, SOMNEs play a significant role with their presence in both advanced and developing economies (Baum et al., 2019). Literature suggests that a higher level of corruption in a given country is associated with a more significant effect of the tax differential on the reported profits (Bilicka and Seidel, 2020). Therefore, it is interesting to investigate how the semi-elasticity differs between different groups with similar levels of corruption by employing our baseline model using the control of corruption as a factor.

An implication proposed when studying corruption over time is the persistence of the corruption indicator over time, which might imply a problem in applying fixed effects to the estimation model. If the control of corruption indicator is time-invariant, the fixed effects approach will eliminate the regressors (Bilicka and Seidel, 2020). When comparing the control of corruption indicator from 2013 to 2020, there exists some variation in control of corruption - illustrated by the countries appearing furthest away from the line in Figure 5.2. In Figure 5.1, some of the countries with the most variance are plotted over the period 2013 to 2020. These findings suggest that there exists some time variance in the indicator.

Figure 5.1: Control of Corruption by Year

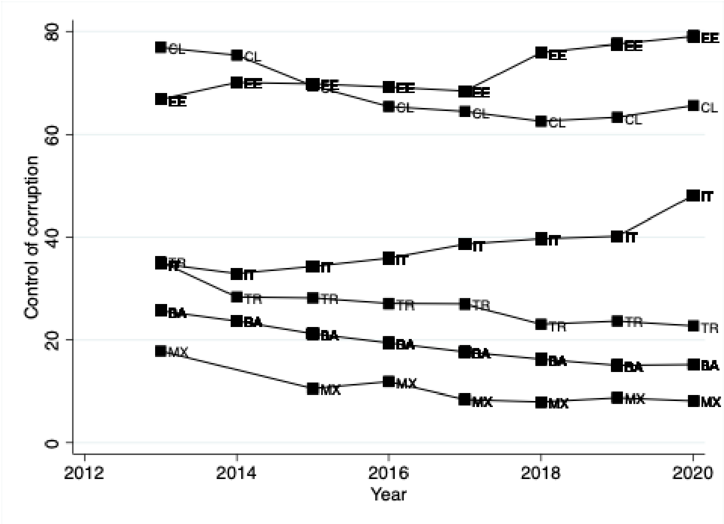
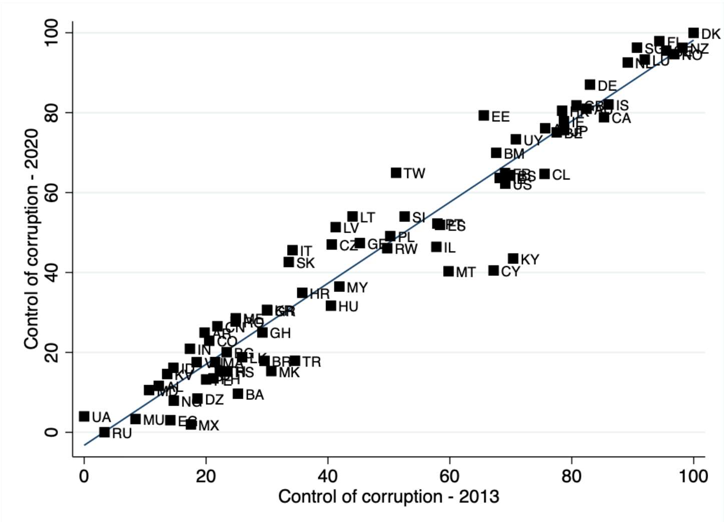


Figure 5.2: Change of Control of Corruption over time



The control of corruption indicator separates the countries by their level of corruption. The least corrupt countries score at the top of the index, while the most corrupt countries have the lower scores. As illustrated in Figure 5.1, Mexico (MX), Bosnia and Herzegovina (BA), Turkey (TR) and Italy (IT) are in the lower distribution in terms of control of corruption and have the most considerable change in the indicator between 2013 and 2020. Countries such as Estonia (EE) and Chile (CL) have experienced a change in the indicator in the higher distribution. Poland (PL) and Norway (NO) are firms with a more stable indicator.

The panel data estimation presented in Table 5.2 presents the samples categorised using the control of corruption indicator. To investigate whether corruption affects the profit shifting behaviour, we apply Equation 3.11 with categories indicating whether the affiliates are in a country with a control of corruption indicator above the 25th, 50th, 75th or 90th percentile.

Column (1) includes a control group of affiliates operating in host countries perceived as the most corrupt within the 25th percentile. These countries have the lowest scores on control of corruption. The semi-elasticity is -0.504 but is not significantly different from zero. Including affiliates operating in host countries above the 25th percentile, countries perceived as less corrupt, the estimation results suggest a lower reported EBIT on average, all else equal. This point estimate is significant at the 1 per cent level, suggesting that less corrupt host countries have relatively lower profits. A possible explanation for this finding is that relatively more competitive markets exist in less corrupt countries, lowering overall profits. The semi-elasticity is an additional 0.990, which is positive and not statistically different from zero. Moreover, the interaction term indicates the effect on the semi-elasticity if the firm is within a SOMNE. Including this interaction term in the regression gives an additional semi-elasticity of 0.506. However, this finding is not significantly different from zero, suggesting that we cannot conclude on a true relationship between the tax differential and reported EBIT.

Similarly to column (1), the regression in column (2) suggests a negative semi-elasticity for affiliates within the 50th percentile, equal to -0.214. However, the estimate is not statistically different from zero. Including affiliates with scores of control of corruption above the 50th percentile, the semi-elasticity is negative and significant at the 1 per cent level. Moreover, the interaction term suggests a semi-elasticity of an additional 0.846 on average but is however insignificant. The state-owned interaction term suggests SOMNEs have an additional semi-elasticity of 0.518. However, the point estimate is not significantly different from zero.

The output from columns (3) and (4) differs from (1) and (2) in terms of the semi-elasticity becoming a positive value. With the inclusion of observations within the 75th and 90th percentile, the point estimates become increasingly positive, equal to 0.074 and 0.080, for (3) and (4) respectively. However, these estimates are insignificant. Moreover, the corruption dummy is now insignificant. The effect of state ownership on the semi-elasticity is 0.570 and 0.571 for (3) and (4), respectively. These point estimates are not significantly different from zero, similar to the point estimates from the previous specifications.

Column (5) divides the affiliates into different categories, consistent with the estimation equation from Equation 3.12. Not surprisingly, the semi-elasticity for the control group is negative, which is similar to the point estimate from columns (1) and (2). Including higher quantiles implies an increasingly more positive semi-elasticity, which is not significantly different from zero. However, the dummies indicate that the inclusion of affiliates that operate within countries with with high control of corruption reports a lower EBIT, all else equal. These dummies are all significant at the 1 per cent level. Similar to the other specifications, the inclusion of the interaction term between the tax differential and state ownership suggests a higher semi-elasticity of 0.501 for SOMNEs. This finding is not significantly different from zero.

The countries operating with a control of corruption indicator within the 50th percentile have negative semi-elasticities. These countries are perceived as relatively more corrupt, as they have lower scores of control of corruption. In other words, these estimates might suggest that corruption amplifies profit shifting behaviour. This finding would be consistent with previous literature suggesting that higher corruption levels affect the tax differential on reported profits negatively (Baum et al., 2019). However, since the semi-elasticity is insignificant at any level, we cannot identify a true relationship between the tax differential and reported EBIT.

Moreover, including the effect that affiliates of SOMNEs have on the tax differential, the semi-elasticity increases. The positive coefficient estimate suggests that an increase in the tax differential is associated with a higher reported EBIT, all else equal. This finding would indirectly imply that the location of affiliates within a SOMNE is not necessarily tax-motivated since the semi-elasticity goes in the opposite direction of previous literature finding indirect evidence of profit shifting behaviour (Lohse and Riedel, 2013; Dischinger, 2010). However, due to limitations in terms of the data on affiliates within the SOMNE and the statistical insignificance, we cannot imply a significant difference between the effect of SOMNEs on the tax differential compared to other MNEs.

Table 5.2: Control of Corruption

	(1) >25th	(2) >50th	(3) >75th	(4) >90th	(5) Categories
Capital	0.147***	0.147***	0.147***	0.147***	0.147***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
logGDP	-0.656	-6.861***	-6.855***	-0.659	-6.853***
	(0.758)	(0.906)	(0.907)	(0.759)	(0.905)
Tax differential	-0.504	-0.214	0.074	0.080	-0.512
	(0.839)	(0.747)	(0.726)	(0.687)	(0.755)
Corruption	-1.019***	-3.674***	0.284	-0.305	
	(0.317)	(0.223)	(0.533)	(0.435)	
Corruption * taxdiff	0.990	0.846	0.263	0.286	
	(0.834)	(0.965)	(1.590)	(1.557)	
State-Owned * taxdiff	0.506	0.518	0.570	0.571	0.501
	(1.355)	(1.333)	(1.307)	(1.306)	(1.381)
Category 2					-3.379***
					(0.322)
Category 2 * taxdiff					1.241
					(0.995)
Category 3					-8.244***
					(0.498)
Category 3 * taxdiff					1.470
					(1.179)
Category 4					-8.748***
					(0.455)
Category 4 * taxdiff					1.368
					(1.139)
N	24865	24865	24865	24865	24865
r2	0.078	0.078	0.078	0.078	0.078
ρ	0.870	0.988	0.982	0.857	0.990
Time FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes

*Note:The table reports the panel data estimation of affiliate-year observations from 2013 to 2020 with fixed industry and country effects. The dependent variable is the logarithm of EBIT. Capital is the logarithm of fixed assets. LogGDP is the logarithm of GDP per capita. Tax difference is the difference between the tax rate of an affiliate and the tax rate of the other majority-owned affiliates within the same MNE, divided by the identified total number of affiliates within the same MNE. All regressions include an interaction term between a dummy variable for observations within a SOMNE and the tax differential variable. Columns (1)-(4) is an extension of the baseline model, represented by Equation 3.11 These regressions include a dummy for observations above the 25th, 50th, 75th and 90th percentile, respectively, divided by the control of corruption indicator. In addition, an interaction term with the dummy multiplied by the tax differential is included. Column (5) separates the control of corruption indicator into four categories based on pre-defined quantiles, included as dummies and as separate interaction terms with the tax differential, represented by 3.12. Standard errors are clustered at the group level and reported in the parenthesis. ***, **, * respectively denotes 1, 5 and 10 per cent significance-level.*

Finally, a country's control of corruption correlates positively with a country's GNI, illustrated by the correlation matrix in Appendix A1.4. This positive correlation suggests that countries with relatively higher development (measured by the GNI score) tend to have higher control of corruption indicators, and vice-versa for countries with relatively lower development. The baseline model failed to identify a true relationship between the tax differential and EBIT. Comparing the results to that of the baseline model in Table 5.1, the findings from using corruption to categorise are similar. However, since the point estimates are insignificant in both the baseline- and the control of corruption model, we cannot tell if there is a true relationship between development, the tax differential and the reported EBIT. This implication also applies to the inclusion of the state-owned effect on the tax differential, which is similar in the two tables but insignificant.

5.3 Regulatory Quality

Regulatory quality is a determining factor for a country's level of development (Silberberger and Königer, 2016). As an alternative explanation of development, we include this indicator to capture the governments' abilities to implement sound regulations and policies that promote and permit development in the private sector (Kaufmann et al., 2011). The indicator measures countries' extensiveness of legal regulations, the efficiency and complexity of the tax system, labour market policies and government invention in the economy. Governments implement different tax rates to control the development of the economy, which often differ between developing and developed countries. Developing economies, on average, collect taxes between 10 to 20 per cent of their GDP, while developing countries with a high level of regulatory quality tax typically 40 per cent (Besley and Persson, 2014).

Table 5.3 represents the baseline model with regulatory quality as a proxy for the development of a country. Dummies are included for the 25th, 50th, 75th and 90th percentile to separate the categories, replicating Equation 3.11.

Column (1) includes the control group of affiliates with the lowest levels of regulatory quality, within the 25th percentile. The semi-elasticity of the tax differential is estimated to be -1.358 but is not significantly different from zero. Moreover, the interaction term connecting regulatory quality and the tax differential is statistically significant at the 1 per cent level. This finding suggests an additional 2.237 in the semi-elasticity, which gives a semi-elasticity of 0.879 (-1.358 + 2.237). A positive coefficient suggests that including affiliates with operations in host countries with higher regulatory quality (above the 25th percentile) increases profits due to an increased tax differential. The positive semi-elasticity suggests that countries with relatively higher regulatory quality shift less profits within the multinational than the control group. Furthermore, adding an interaction term for state-owned affiliates multiplied by the tax difference increases the semi-elasticity by 0.569, which is not significantly different from zero.

Column (2) reports similar results to (1), including all affiliates within the 50th percentile to the control group. The semi-elasticity decreases to -0.256, but the point estimate is not statistically significant. Furthermore, including the interaction term between the effect of relatively higher regulatory quality and the tax differential, the semi-elasticity increases by 0.988, which is not statistically significant. Similarly, the point estimate of the interaction term between the state-owned dummy and the tax differential gives an additional 0.547 to the semi-elasticity. This finding is not significantly different from zero.

The control group in the regression output from column (3) contains all affiliates within the 75th percentile. The semi-elasticity becomes positive for the control group, but the estimate is insignificant. With the inclusion of affiliates in host countries above the 75th percentile, EBIT increases on average, all else equal. This point estimate is significant at the 1 per cent level. The increase in reported EBIT follows existing literature stating that bettering the quality of policy implementation increases performance (Curristine et al., 2007). This finding might suggest that affiliates that operate in countries with better regulatory quality profit from this political characteristic.

Moreover, the effect of higher regulatory quality on the tax differential is negative, equal to -0.142. However, due to its insignificance, we cannot identify a significant difference between the categorisations. Similarly to (1) and (2), the effect of SOMNEs on the tax differential gives an additional 0.616 to the semi-elasticity, which is insignificant.

Column (4) presents the affiliates operating in countries with a regulatory quality indicator within the 90th percentile. The semi-elasticity is 0.172, not significantly different from zero. Moreover, The estimated coefficient of log of GDP per capita is negative, which implies that higher productivity proxied by a higher GDP per capita decreases the reported EBIT, all else equal. This point estimate is significant at the 1 per cent level. Similar to the previous regressions, the effect of higher regulatory quality on the tax differential gives a point estimate of -0.437, and the effect of SOMNEs on the tax differential gives an additional 0.642 to the semi-elasticity. Both point estimates are insignificant.

Column (5) divides the affiliates into four categories, consistent with the estimation equation presented in Equation 3.12. The point estimate of the semi-elasticity is negative in similarity to the control groups in columns (1) and (2). The tax differential becomes significant at the 10 per cent level, suggesting that an increase in the tax differential is related to a decrease in reported EBIT in that specific country. The semi-elasticity of the tax differential becomes increasingly positive and highly statistically significant for all categories. These positive semi-elasticities imply different profit shifting behaviour in affiliates located in countries with a high level of regulatory quality than what the previous literature does, finding negative semi-elasticities (Heckemeyer and Overesch, 2017). Including the interaction term, indicating the effect of affiliates within a SOMNE on the semi-elasticity yields similar results to columns (1) to (4). This finding is, however, not significantly different from zero.

From columns (1) to (4), the semi-elasticity becomes increasingly positive with the inclusion of affiliates operating in host countries with higher regulatory quality. Comparing the findings from column (5) to that of column (1), the effect in terms of the magnitude is similar. However, the point estimate is statistically significant, suggesting that an increase in the tax differential decreases the profits reported in that specific host country, all else equal. This finding might suggest that in countries with a relatively lower regulatory quality, the tax system is less complex, and the effectiveness of legal regulations might make it easier for MNEs to shift profits at a lower cost. As costs arise when a firm modifies its accounts and adopts new investment patterns to comply with tax authorities, low regulatory quality could be a determinant for the location of affiliates. In other words, an increase in the tax differential promotes profit shifting to affiliates located in countries with lower regulatory quality.

Table 5.3: Regulatory Quality - Panel Data 2013-2020

	(1) >25th	(2) >50th	(3) >75th	(4) >90th	(5) Categories
Capital	0.147***	0.147***	0.147***	0.147***	0.147***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
logGDP	-0.654	-0.651	0.718	-6.850***	-0.643
	(0.756)	(0.759)	(0.914)	(0.907)	(0.755)
Tax differential	-1.358	-0.256	0.138	0.172	-1.469*
	(0.855)	(0.756)	(0.679)	(0.697)	(0.756)
RQ	0.179	-0.192	1.719***	0.283	
	(0.253)	(0.166)	(0.320)	(0.533)	
RQ * taxdiff	2.237***	0.988	-0.142	-0.437	
	(0.839)	(0.863)	(0.990)	(1.719)	
State-Owned * taxdiff	0.569	0.547	0.616	0.642	0.746
	(1.384)	(1.361)	(1.290)	(1.278)	(1.397)
Category 2					-0.470**
					(0.224)
Category 2 * taxdiff					3.249***
					(1.033)
Category 3					0.763
					(0.528)
Category 3 * taxdiff					3.277**
					(1.334)
Category 4					0.488***
					(0.067)
Category 4 * taxdiff					3.510**
					(1.645)
N	24865	24865	24865	24865	24865
r2	0.078	0.078	0.078	0.078	0.079
ρ	0.851	0.856	0.863	0.982	0.847
Time FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes

*Note: The table reports the panel data estimation of affiliate-year observations from 2013 to 2020 with fixed industry and country effects. The dependent variable is the logarithm of EBIT. Capital is the logarithm of fixed assets. LogGDP is the logarithm of GDP per capita. Tax difference is the difference between the tax rate of an affiliate and the tax rate of the other majority-owned affiliates within the same MNE, divided by the identified total number of affiliates within the same MNE. All regressions include an interaction term between a dummy variable for observations within a SOMNE and the tax differential variable. Columns (1)-(4) is an extension of the baseline model, represented by Equation 3.11.These regressions include a dummy for observations above the 25th, 50th, 75th and 90th percentile, respectively, divided by the regulatory quality (RQ) indicator. In addition, an interaction term with the dummy multiplied by the tax differential is included. Column (5) separates the regulatory quality indicator into four categories based on pre-defined quantiles, including dummies and separate interaction terms with the tax differential, represented by 3.12. Standard errors are clustered at the group level and reported in the parenthesis. ***, **, * respectively denotes 1, 5 and 10 per cent significance-level.*

With the inclusion of the Category 2 to 4, the semi-elasticity becomes increasingly positive. This finding proposes that countries with higher regulatory quality react positively to a change in the tax differential. On the one hand, this finding is contrary to that of profit shifting literature, which points out a negative semi-elasticity (Heckemeyer and Overesch, 2017). On the other hand, few empirical papers focus on the difference between developing and developed countries regarding profit shifting behaviour. The score of regulatory quality increases with the government's ability to implement sound regulations, which could affect the cost of profit shifting for a MNE in a country with higher regulatory quality. As proposed by Hines and Rice (1994) and Huizinga and Laeven (2008), the MNE is proposed with a cost when manipulating their transfer prices. Higher government intervention in the economy and more complex tax systems might impose difficulties when shifting profits to lower-taxed affiliates, which might raise the cost of profit shifting. As a result, possible tax savings from profit shifting might not compensate the firm for the costs incurred if the government decides to interfere. This finding could be a potential explanation for the semi-elasticity becoming increasingly positive with higher levels of regulatory quality.

Regulatory quality is highly correlated to GNI, illustrated in the correlation matrix in Appendix A1.4, implying a positive relationship between the development of a country and the level of regulatory quality. Comparing the results from Table 5.3 to that of the baseline model, the output yields similar results. Nevertheless, we could not conclude a true relationship in the baseline model due to the statistically insignificant coefficient estimates. Considering the statistical significance of the semi-elasticity in column (5), we can interpret a significant relationship between the tax incentive and reported EBIT by categorising different host countries by their score of regulatory quality.

5.4 Unemployment

The rate of unemployment describes the economic situation of a country. For enterprises investing across borders, the unemployment rate is a measure of a high supply of labour, which could attract them and indicate a relatively more rigid labour market, which could be discouraging. The previous litterateur has suggested that high unemployment rates seem to attract European investors (Basile et al., 2008). In contrast, high wages, skilled workers and strategic assets attract non-European MNEs. In other words, the unemployment rate of the host country could therefore facilitate a MNE's recruitment in that specific country. In the setting of SOMNEs, foreign direct investment often develops new sectors and fosters innovation, especially in developing countries (IMF, 2020). Affiliates within SOMNEs are often operating in more strategic industries such as utilities, electricity and transportation, which are more technology-intensive (Soete, 1991). This finding might suggest that unemployment might not be an essential determinant for the location of foreign affiliates. Doing regressions separating affiliates in host countries with different unemployment rates might give a better intuition on how the economic situation of a country affects the tax incentive and whether this socio-political characteristic affects the semi-elasticity of affiliates within a SOMNE.

Table 5.4 represent Equation 3.11 applied with categories separating the affiliates based on their unemployment rate. The categories indicate whether the affiliate's host country has an unemployment rate above the 25th, 50th, 75th or 90th percentile.

Column (1) includes the control group of affiliates operating in a host country with a lower unemployment rate (within the 25th percentile). The coefficient estimate of the log of GDP per capita is significantly negative, indicating that profits decrease with general economic developments. This negative coefficient estimate might suggest that competition is more intense in markets with lower unemployment, which drives profits down. The semi-elasticity is -0.328, not significantly different from zero. Including affiliates in host countries above the 25th percentile gives a negative coefficient estimate, suggesting that higher unemployment is associated with lower profitability, all else equal. This coefficient estimate is significant at the 1 per cent level. The point estimate of the semi-elasticity is an additional 0.593, but it is not significantly different from zero. Affiliates within a SOMNE impose an additional semi-elasticity of 0.703. However, the point estimate is not significantly different from zero.

Moving from the regression output in column (1) to (2), the coefficient estimate of the log of GDP becomes positive and significant at the 1 per cent level for affiliates operating in countries within the 50th percentile in terms of unemployment. This finding suggests that profits increase with the general economic development. Moreover, the tax differential has a semi-elasticity of -0.180, not significantly different from zero. Including the dummy variable suggests that a higher unemployment rate is associated with higher reported EBIT. This finding is contrary to the findings from column (1). However, the estimation result might suggest that affiliates in host countries with higher unemployment rate experience less competitive markets and, therefore, higher profitability, all else equal. Similar to the output from (1), including the interaction term with SOMNEs and the tax differential adds 0.658 to the semi-elasticity. However, it is not significantly different from zero. We cannot identify a significant difference in SOMNEs affiliates' effect on the semi-elasticity compared to other affiliates because of the insignificant point estimate.

The output from columns (3) and (4) is similar to (1) and (2) in terms of the semi-elasticity estimates. Similarly, the point estimates are negative, respectively, -0.464 and -0.112 for the output from (3) and (4). However, the log GDP point estimate becomes insignificant in column (3), suggesting that we cannot identify a true relationship between the log of GDP per capita and EBIT for affiliates with a host country within the 75th percentile. In column (4), the log of GDP per capita is statistically significant at the 1 per cent level, and the coefficient estimate is negative, which gives the same interpretation as in column (1). With the inclusion of the dummy variables, the point estimate indicates that EBIT on average is higher than for the control group, all else equal. This finding is significant at the 1 per cent level and might suggest that competition in these markets is less intense, driving profits upwards. By including the interaction terms with unemployment and the tax differential, the point estimate in column (3) is 1.949, significant at the 5 per cent level. This finding suggests that countries with a higher unemployment rate, on average, have a positive semi-elasticity. Moreover, the state-owned effect on the tax differential returns a point estimate of 0.789 and 0.665 for (3) and (4), which is not significantly different from zero.

Column (5) divides the sample into different categories, consistent with the estimation equation presented in Equation 3.12. The regression output is similar to the previous regressions in terms of the semi-elasticity estimate for the control group. Firstly, including the Category 2 interaction term increases the semi-elasticity by 0.267. Secondly, the inclusion of the Category 3 interaction term increases the semi-elasticity by 0.926, while the dummy implies that reported EBIT decreases. The dummy is statistically significant at the 1 per cent level. Thirdly, the inclusion of the Category 4 interaction term returns

Table 5.4: Unemployment - Panel Data - 2013-2020

	(1) >25th	(2) >50th	(3) >75th	(4) >90th	(5) Categories
Capital	0.147***	0.147***	0.147***	0.147***	0.147***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
logGDP	-6.845***	2.256***	-0.064	-1.405***	-0.534
	(0.907)	(0.645)	(0.352)	(0.438)	(0.668)
Tax differential	-0.328	-0.180	-0.464	-0.112	-0.235
	(0.860)	(0.835)	(0.706)	(0.672)	(0.768)
Unemployment	-1.153***	2.287***	1.303***	1.855***	
	(0.129)	(0.300)	(0.125)	(0.205)	
Unemployment * taxdiff	0.593	0.521	1.949**	1.086	
	(0.846)	(0.843)	(0.989)	(0.904)	
State-Owned * taxdiff	0.703	0.658	0.789	0.665	0.702
	(1.306)	(1.299)	(1.231)	(1.282)	(1.297)
Category 2					0.004
					(0.066)
Category 2 * taxdiff					0.267
					(0.812)
Category 3					-4.209***
					(0.435)
Category 3 * taxdiff					0.926
					(0.933)
Category 4					0.052
					(0.296)
Category 4 * taxdiff					0.489
					(1.136)
N	24865	24865	24865	24865	24865
r2	0.078	0.078	0.078	0.078	0.078
ρ	0.983	0.925	0.864	0.903	0.912
Time FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes

*Note: The table reports the panel data estimation of affiliate-year observations from 2013 to 2020 with fixed industry and country effects. The dependent variable is the logarithm of EBIT. Capital is the logarithm of fixed assets. LogGDP is the logarithm of GDP per capita. Tax difference is the difference between the tax rate of an affiliate and the tax rate of the other majority-owned affiliates within the same MNE, divided by the identified total number of affiliates within the same MNE. All regressions include an interaction term between a dummy variable for observations within a SOMNE and the tax differential variable. Columns (1)-(4) is an extension of the baseline model, represented by Equation 3.11. These regressions include a dummy for observations above the 25th, 50th, 75th and 90th percentile, respectively, divided after the unemployment rate. In addition, an interaction term with the dummy multiplied by the tax differential is included. Column (5) separates the unemployment rate into four categories based on pre-defined quantiles, including dummies and separate interaction terms with the tax differential, represented by 3.12. Standard errors are clustered at the group level and reported in the parenthesis. ***, **, * respectively denotes 1, 5 and 10 per cent significance-level.*

a semi-elasticity of an additional 0.489. None of the interaction terms appears to be statistically significant, making it difficult to infer the relationship between the tax differential and reported EBIT. Similarly to all the previous regressions, the inclusion of the state-owned interaction term adds 0.702 to the semi-elasticity, which is insignificant.

Overall, affiliates operating in host countries with a lower rate of unemployment report on average lower EBIT, all else equal. This finding suggests that affiliates operating within markets with lower unemployment rates (within the 25th percentile) report lower profits due to higher competition. With an increase in the unemployment rate, EBIT becomes significantly higher, potentially due to less competitive markets. The semi-elasticity is negative for affiliates operating in host countries with relatively lower levels of unemployment and increasingly positive when unemployment increases. The majority of the semi-elasticities are insignificant at any level, and we cannot identify a true relationship between the tax differential and EBIT. However, the semi-elasticity when including affiliates operating above the 75th percentile is significant and positive, suggesting that countries with higher unemployment reports higher profits when the tax differential increases. This finding contradicts the literature, finding negative semi-elasticities (Heckemeyer and Overesch, 2017). In this percentile, observations from more developed countries such as Italy and Spain are categorized as relatively less developed compared to the control group. Therefore, the categorisation after unemployment does not necessarily reflect the development of the specific host country. As a result, the categorisations might not model the differences in development.

Taking the effect of SOMNEs on the tax differential into account, the semi-elasticity becomes positive. This positive point estimate might imply that a change in the tax differential between affiliates within SOMNEs increases the profits reported in that country. This finding might suggest that even in host countries with high unemployment, SOMNEs will report, on average, higher EBIT when the tax differential increases. The estimate is contrary to previous literature suggesting a negative semi-elasticity (Heckemeyer and Overesch, 2017). However, we cannot identify a significant difference between the tax incentive of SOMNEs and those without state ownership.

In summary, comparing these results with the baseline model, which suggests that countries with lower development (in terms of GNI) on average have a negative semi-elasticity, we find that affiliates operating in host countries with higher unemployment on average report positive semi-elasticities. The correlation between GNI and unemployment is negative, suggesting that the unemployment rate decreases when development improves. Therefore, we would expect the semi-elasticity to be negative for affiliates in host countries with a relatively higher unemployment rate. However, the semi-elasticities are mostly insignificant similar to the baseline model. A possible explanation for the difference in results might be because high unemployment is a phenomenon in countries with relatively higher development - such as Italy or Spain. These countries appear above the 75th percentile in terms of unemployment and above the 50th percentile in terms of GNI. The categorisations are inconsistent with the baseline analysis, as they do not divide the observations after their overall development.

5.5 Government Effectiveness

To investigate how differences in countries' government policies affect the affiliates' profit shifting behaviour, we include government effectiveness as an indicator in the regressions presented in Table 5.5. Weak governance harms all firms but has an especially deleterious effect on state-owned enterprises (Baum et al., 2019). As mentioned in the literature review, SOMNEs and MNEs often face different governance mechanisms, especially in countries with liberal market economies (Rygh and Benito, 2021). Government effectiveness measures how independent the population is from political pressure, the quality of public services and how credible the government's commitment is to existing policies (Kaufmann et al., 2011). Comparing SOMNEs and MNEs, SOMNEs benefit more from political relations between the host and home country, reducing risk and mitigating exposure to expropriation risk (Cuervo-Cazurra et al., 2014). Because of expropriation risk, government effectiveness is an important determinant when investing in both developed and developing economies. As the main objectives of SOMNEs are to help address market failures and achieve economic and social policies at a reasonable cost, the effectiveness of the government is of great importance. Regressing our baseline model, separating the observations into groups depending on their government effectiveness, might give a better intuition on how this characteristic affects the incentive to shift profits and whether the incentive is significantly different between SOMNEs and MNEs.

The dummy variable and the interaction term in Table 5.5 divide the sample into the 25th, 50th, 75th and 90th percentile, indicating if the affiliate with a location in a host country with government effectiveness above the given percentile. The specification corresponds to the expression in Equation 3.11.

The control group in column (1) consists of affiliates operating in a host country with a score on government effectiveness within the 25th percentile. The semi-elasticity of -1.938 is statistically significant at the 10 per cent level. Interpreting this point estimate, a 10 per cent increase in the tax differential is associated with a 19.38 per cent decrease in reported profits, all else equal. Adding the dummy for the countries above the 25th percentile suggests a higher reported EBIT, all else equal. This finding suggests that profits increase when the government is more committed to its policies. The effect of adding the government effectiveness dummy is significant at the 1 per cent level.

Moreover, including the interaction term multiplying the government effectiveness dummy and the tax differential, the semi-elasticity increases by 2.775. The point estimate is significant at the 5 per cent level, suggesting that affiliates in host countries with better government effectiveness report a higher EBIT when the tax differential increases. This finding is inconsistent with the negative semi-elasticities calculated in previous profit shifting literature and can be explained by governments being more committed to their policies in countries with higher government effectiveness. Adding the interaction term between state ownership and the tax differential increases the semi-elasticity by an additional 0.378. However, the point estimate is not statistically significant, and interpretation must be done with caution.

Similarly to the output from (1), column (2) returns a negative semi-elasticity of -0.271. The point estimate becomes insignificant when the control group expands to include all affiliates operating in host countries within the 50th percentile in column (2). With the inclusion of the observations above the 50th percentile, the dummy and the interaction term is still positive, the latter adding a semi-elasticity of an additional 1.011. Nevertheless, we cannot conclude that there exists a true relationship as the coefficient is statistically insignificant. Adding the interaction term between state ownership and the tax differential increases the semi-elasticity by 0.523. Similarly to the output from (1), this point estimate is not statistically significant.

Table 5.5: Government Effectiveness - Panel Data 2013-2020

	(1) >25th	(2) >50th	(3) >75th	(4) >90th	(5) Categories
Capital	0.147***	0.147***	0.147***	0.147***	0.147***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
logGDP	-0.648	-0.651	5.235***	7.241***	0.399
	(0.757)	(0.759)	(1.264)	(1.490)	(1.246)
Tax differential	-1.938*	-0.271	0.134	0.165	-0.539
	(1.091)	(0.769)	(0.677)	(0.686)	(0.758)
GE	4.566***	0.446	-0.056	1.166**	
	(0.309)	(0.283)	(0.625)	(0.485)	
GE * taxdiff	2.775**	1.011	-0.101	-0.369	
	(1.117)	(0.992)	(0.818)	(1.222)	
State-Owned * taxdiff	0.378	0.523	0.610	0.633	0.818
	(1.252)	(1.334)	(1.293)	(1.278)	(1.240)
Category 2					-0.346
					(0.317)
Category 2 * taxdiff					1.781**
					(0.778)
Category 3					0.492
					(0.701)
Category 3 * taxdiff					1.075
					(1.127)
Category 4					2.448***
					(0.449)
Category 4 * taxdiff					-0.501
					(1.150)
N	24865	24865	24865	24865	24865
r2	0.078	0.078	0.078	0.078	0.078
ρ	0.889	0.844	0.969	0.984	0.847
Time FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes

Note:*The table reports the panel data estimation of affiliate-year observations from 2013 to 2020 with fixed industry and country effects. The dependent variable is the logarithm of EBIT. Capital is the logarithm of fixed assets. LogGDP is the logarithm of GDP per capita. Tax difference is the difference between the tax rate of an affiliate and the tax rate of the other majority-owned affiliates within the same MNE, divided by the identified total number of affiliates within the same MNE. All regressions include an interaction term between a dummy variable for observations within a SOMNE and the tax differential variable. Columns (1)-(4) is an extension of the baseline model, represented by Equation 3.11. These regressions include a dummy for observations above the 25th, 50th, 75th and 90th percentile, respectively, divided by the government effectiveness (GE) indicator. In addition, an interaction term with the dummy multiplied by the tax differential is included. Column (5) separates government effectiveness into four categories based on pre-defined quantiles, including dummies and separate interaction terms with the tax differential, represented by 3.12. Standard errors are clustered at the group level and reported in the parenthesis. ***, **, * respectively denotes 1, 5 and 10 per cent significance-level.*

Columns (3) and (4) expand the control group to include affiliates with host countries within the 75th and 90th percentile, respectively. The estimate of the semi-elasticity becomes positive for the control group in both regressions, equal to 0.134 and 0.165, respectively, but does not appear statistically different from zero. In both columns, the log of GDP per capita is significant at the 1 per cent level and positive, suggesting that profits increase with general development. The interaction term in column (3) yields a negative semi-elasticity of an additional -0.101. The estimate in column (4) is also negative, decreasing the semi-elasticity by -0.369. Both point estimates are insignificant. The dummy in column (4) includes the affiliates operating above the 90th percentile, which is positive and significant at the 5 per cent level. This finding is similar to the regression output from (1), implying that countries with relatively better government effectiveness on average report higher EBIT. Similar to the previous regressions, the state-owned affiliates' effect on semi-elasticities are 0.610 and 0.633 for (3) and (4), respectively. However, the point estimate is not statistically significant.

Column (5) divides the affiliates into four categories based on their level of government effectiveness. The semi-elasticity of the control group gives a point estimate of -0.539. Similar to the previous specifications, the estimate is not significantly different from zero. The inclusion of Category 2 increases the semi-elasticity by 1.781, suggesting that an increase in the tax differential increases the reported EBIT in that specific host country, all else equal. This finding is significant at the 5 per cent level. Category 3 increases the semi-elasticity by 1.075, while Category 4 decreases the semi-elasticity by 0.501.

Nevertheless, since these point estimates are insignificant, we cannot draw inference on a true relationship. The inclusion of affiliates within the 90th percentile suggests an increase in reported profits, similar to the estimate from column (4). This finding is significant at the 1 per cent level. Moreover, including the state-owned interaction term with the tax differential increases the semi-elasticity by 0.818, all else equal. Similarly to the previous estimates, this point estimate is not statistically significant.

Moving from (1) to (4), the tax differential becomes increasingly positive, suggesting that the inclusion of affiliates in host countries with higher government effectiveness is associated with an increase in reported EBIT. Because the semi-elasticity is significant when including only the affiliates with the relative lowest government effectiveness, there exists a significant relationship between the tax differential and the reported EBIT. When firms respond strongly to profit shifting incentives, increasing the tax differential decreases the government's revenue. Considering that affiliates in host countries with a relatively lower score of government effectiveness appear to be shifting profits, this might suggest that government effectiveness is an important determinant when multinationals expand their business across borders. Comparing the regression output from (6) in terms of the inclusion of Category 2 (4th-6th quantile), the effect on the semi-elasticity becomes significantly positive. This finding suggests that an increase in the tax differential also increases the reported EBIT in that specific country, possibly because the cost of profit shifting increases when governments are more dedicated to their policies and are more effective. Considering the effect that affiliates of SOMNEs have on the tax incentive, the additional semi-elasticity is positive in (1) to (6) but negative for affiliates operating within the 25th percentile. However, this finding is not statistically significant, and inference cannot be drawn.

Finally, comparing the findings to the baseline model, there seems to be a similar effect of a tax differential on the reported EBIT. However, when government effectiveness categorises the sample, the tax differential for the countries with the lowest government effectiveness (within the 25th percentile) is negative and significant. Moreover, including affiliates above the 25th percentile increases the semi-elasticity to become positive, which is significant. The correlation between government effectiveness and GNI is illustrated in the correlation matrix in Appendix A1.4, suggesting that government effectiveness increases when development improves. These findings seem to be following that of the baseline model. However, the increased significance levels reveal a negative relationship between the tax differential and the reported EBIT, consistent with previous literature.

6 Robustness Checks

Several robustness tests are employed to test the robustness of our findings in the panel data analysis and investigate if the findings are valid. First, we conduct the regressions using a different tax sensitivity measure. The second robustness test removes the multinationals with only one affiliate to check if the size of the MNE affects the results.

6.1 Alternative Tax Incentive Measure

To examine the validity of the tax measure used repeatedly in the analysis, we apply the weighted tax differential as a proxy for the tax differential used in the main analysis. The proxy is applied in the regressions using government effectiveness and regulatory quality. These regressions returned a significant relationship between the tax differential and reported EBIT for several categories, which is of interest to the robustness test. The robustness tests can strengthen the validity of the given interpretation of the statistically significant point estimates in the empirical analysis. Estimating the tax incentive correct is crucial for the validity of the analysis, as the measure affects the scale of the profit shifting behaviour.

Following the methodology proposed by Huizinga and Laeven (2008), we calculate the weighted tax differential by taking the difference between a subsidiary's tax rate and the tax rate of all other affiliates within the specific multinational, weighted by the affiliates' amount of sales relative to the total amount of the multinational. An important implication is the construction of the measure, weighting the total sales as a sum of the identified affiliates, which might imply that the lack of data on all affiliates creates biased weights.

Table 6.1 and 6.2 provide regressions using the proxy, using regulatory quality and government effectiveness as indicators. When the weighted tax differential is negative, the multinational will shift profits out of the subsidiary.

Firstly, Table 6.1 provides results using regulatory quality for categorizations. Recall that in our main analysis (see Table 5.3) using this governance indicator, the interaction term between the dummy, including affiliates above the 25th percentile in terms of regulatory quality and the tax differential, returned a positive coefficient significant at the 1 per cent level. In similarity with the regressions in the main analysis, the interaction term between the weighted tax differential and affiliates above the 25th percentile is positive. The significance is reduced to 10 per cent when the weighed tax difference is employed. Moreover, comparing the results from column (5) in our main analysis, the significance of the tax incentive from the control group is reduced and is not significantly different from zero. The interaction terms, including the second and third categories, have similar significance and magnitude to the weighted tax difference. However, the inclusion of the interaction term with the fourth category and the weighted tax differential is insignificant.

Secondly, Table 6.2 provides results using government effectiveness for categorizations. The government effectiveness dummy remains significant and positive in columns (1) and (4), proposing similar results to that of the main analysis (see Table 5.5). With the inclusion of the weighted tax difference, the significance of the semi-elasticity estimates decreases from the 5 per cent level to become insignificant. The inclusion of the interaction term in column (1) returns a positive and significant coefficient, but the significance decrease from the 5 per cent level to 10 per cent. In column (5), the interaction terms return similar results with similar magnitude and significance. However, the inclusion of the second category with the effect on the weighted tax differential gives a higher significance (1 per cent level). The R - squared becomes higher using the weighted tax differential, possibly because the regression controls for sales and captures more variation.

The weighted tax differential provides similar overall results as the tax differential. This finding strengthens the robustness of the results and enables the interpretation of the estimates. The tax differential employed in our main regressions suffers less from the data availability implications regarding financial key information and is, therefore, the preferred measure. However, the baseline model is sensitive to different tax incentive measures as the semi-elasticities differ in significance.

Table 6.1: Robustness of the Tax Differential using Regulatory Quality

	(1) >25th	(2) >50th	(3) >75th	(4) >90th	(5) Categories
Capital	0.147***	0.147***	0.147***	0.147***	0.147***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
logGDP	-0.651	-0.650	0.724	-6.835***	-0.645
	(0.758)	(0.758)	(0.913)	(0.904)	(0.757)
weighted taxdiff	-0.290	0.221	0.664	0.831	-0.738
	(0.757)	(0.733)	(0.649)	(0.660)	(0.699)
RQ	0.176	-0.189	1.719***	0.279	
	(0.253)	(0.165)	(0.320)	(0.533)	
RQ * weighted taxdiff	1.262*	0.754	-0.918	-2.597	
	(0.729)	(0.799)	(1.002)	(1.727)	
State-Owned * weighted taxdiff	-1.340	-1.310	-1.120	-0.986	-1.225
	(1.658)	(1.670)	(1.614)	(1.608)	(1.646)
Category 2					-0.396*
					(0.222)
Category 2 * weighted taxdiff					3.005***
					(0.848)
Category 3					0.828
					(0.528)
Category 3 * weighted taxdiff					2.493**
					(1.092)
Category 4					0.557***
					(0.059)
Category 4 * weighted taxdiff					1.285
					(1.598)
N	24865	24865	24865	24865	24865
r2	0.078	0.078	0.078	0.078	0.079
ρ	0.850	0.856	0.863	0.982	0.846
Time FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes

*Note:The table reports the panel data estimation, consisting of affiliate-year observations from 2013 to 2020. The dependent variable is the logarithm of EBIT. Capital is the logarithm of fixed assets. LogGDP is the logarithm of GDP. The weighted tax difference is the difference between the tax rate of an affiliate and the tax rate of the other majority-owned affiliates within the same multinational, weighted by the affiliate's sales on the total sales of the multinational. All regressions include an interaction term between a dummy variable for observations within a SOMNE and the weighted tax differential variable.Regression (1)-(4) is an extension of the baseline model, represented by Equation 3.11. These regressions include a dummy for observations above the 25th, 50th, 75th and 90th percentile, respectively, divided by the regulatory quality (RQ) indicator. In addition, an interaction term with the dummy multiplied by the weighted tax differential is included. Regression (5) separates regulatory quality into four categories based on pre-defined quantiles, included as dummies and as separate interaction terms with the weighted tax differential, represented by Equation 3.12. Standard errors are clustered at the group level and reported in the parenthesis. ***, **, * respectively denotes 1, 5 and 10 per cent significance-level.*

Table 6.2: Robustness of the Tax Differential using Government Effectiveness

	(1) >25th	(2) >50th	(3) >75th	(4) >90th	(5) Categories
Capital	0.147***	0.147***	0.147***	0.147***	0.147***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
logGDP	-0.646	-0.653	5.235***	7.210***	0.400
	(0.759)	(0.759)	(1.259)	(1.489)	(1.248)
weighted taxdiff	-0.702	0.455	0.620	0.672	-0.157
	(0.942)	(0.743)	(0.644)	(0.654)	(0.731)
GE	4.467***	0.448	-0.061	1.156**	
	(0.302)	(0.284)	(0.622)	(0.483)	
GE * weighted taxdif	1.703*	0.170	-0.560	-1.219	
	(0.948)	(0.885)	(0.795)	(1.362)	
State-Owned * weighted taxdiff	-1.314	-1.246	-1.179	-1.118	-0.880
	(1.549)	(1.615)	(1.621)	(1.618)	(1.590)
Category 2					-0.268
					(0.320)
Category 2 * weighted taxdiff					2.105***
					(0.671)
Category 3					0.567
					(0.702)
Category 3 * weighted taxdiff					0.661
					(1.109)
Category 4					2.520***
					(0.449)
Category 4 * weighted taxdiff					-1.056
					(1.445)
N	24865	24865	24865	24865	24865
r2	0.078	0.078	0.078	0.078	0.079
ρ	0.887	0.844	0.969	0.984	0.847
Time FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes

Note:*The table reports the panel data estimation, consisting of affiliate-year observations from 2013 to 2020. The dependent variable is the logarithm of EBIT. Capital is the logarithm of fixed assets. LogGDP is the logarithm of GDP. The weighted tax difference is the difference between the tax rate of an affiliate and the tax rate of the other majority-owned affiliates within the same multinational, weighted by the affiliate's sales on the total sales of the multinational. All regressions include an interaction term between a dummy variable for observations within a SOMNE and the weighted tax differential variable. Regression (1)-(4) is an extension of the baseline model, represented by equation 3.11. These regressions include a dummy for observations above the 25th, 50th, 75th and 90th percentile, respectively, divided by the government effectiveness (GE) indicator. In addition, an interaction term with the dummy multiplied by the weighted tax differential is included. Regression (5) separates government effectiveness into four categories based on pre-defined quantiles, included as dummies and as separate interaction terms with the weighted tax differential, represented by Equation 3.12. Standard errors are clustered at the group level and reported in the parenthesis. ***, **, * respectively denotes 1, 5 and 10 per cent significance-level.*

6.2 Removing Multinationals with only one Foreign Affiliate

The final sample included in the panel data analysis consists of many affiliate-year observations where the affiliate is the only affiliate included within a multinational. Because of the exclusion of parent observations, these affiliates will have a tax differential equal to zero due to the construction of the tax differential. Moreover, because of the sampling restrictions and the Orbis database's implications, many affiliates are removed because of missing accounting information or ownership linkages. To check the robustness of the estimation results carried out in Table 5.3 and 5.5 in the main analysis, the regression excludes affiliates with only one identified affiliate. Removing these observations implies a reduction in the sample size of 10.096 affiliates, whereas 9.580 are affiliates within multinationals without state ownership and 516 are affiliates within a SOMNE. As a result, the new sample consists of 14.769 observations.

Table 6.3 presents the results with multinationals consisting of at least two affiliates. Comparably to the regressions carried out in Table 5.3 in the main analysis, the interaction-term between affiliates operating above the 25th percentile in terms of regulatory quality and the tax differential gives a positive coefficient estimate which is significant at the 5 per cent level. The significance level has dropped from 1 to 5 per cent. Moreover, the dummy is positive, with a significance at the 1 per cent level, which is different from the previous regression. Interpreting the point estimate, it might suggest that larger multinationals (with at least more than one identified affiliate abroad) with higher regulatory quality are associated with a higher reported EBIT, all else equal.

Interpreting column (6), the semi-elasticity for the control group becomes positive and insignificant. Therefore, we cannot say if the affiliates within this percentile are statistically different from affiliates in the upper distribution in terms of regulatory quality. With the inclusion of categories in the interaction terms, the two models yield similar results regarding the coefficients and significance levels. All dummies, including the effect of the affiliates operating in host countries with higher regulatory quality, are significant at the 1 per cent level. This finding implies that larger multinationals with more than one affiliate better explain the variation in EBIT than the previous model, reflected by a higher R-squared.

Table 6.3: Robustness of Big Firms using Regulatory Quality

	(1) >25th	(2) >50th	(3) >75th	(4) >90th	(5) Categories
Capital	0.128***	0.128***	0.128***	0.128***	0.128***
	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)
logGDP	2.993***	3.005***	3.007***	-0.178	2.993***
	(0.201)	(0.207)	(0.208)	(0.314)	(0.201)
Tax differential	-1.029	0.517	0.777	1.039	-0.986
	(1.299)	(1.051)	(0.978)	(0.967)	(1.018)
RQ	1.289***	0.060	0.583	0.891***	
	(0.271)	(0.197)	(0.794)	(0.133)	
RQ * taxdiff	2.616**	0.662	0.034	-1.713	
	(1.219)	(1.029)	(1.476)	(1.699)	
State-Owned * taxdiff	0.487	0.419	0.414	0.485	0.520
	(1.878)	(1.806)	(1.775)	(1.728)	(1.852)
Category 2					-1.367***
					(0.370)
Category 2 * taxdiff					3.616***
					(1.122)
Category 3					-1.551***
					(0.243)
Category 3 * taxdiff					3.388**
					(1.360)
Category 4					1.712***
					(0.249)
Category 4 * taxdiff					2.187*
					(1.256)
N	14769	14769	14769	14769	14769
r2	0.085	0.085	0.085	0.085	0.086
ρ	0.946	0.935	0.938	0.844	0.938
Time FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes

*Note:The table reports the panel data estimation of affiliate-year observations from 2013 to 2020 with fixed industry and country effects. The dependent variable is the logarithm of EBIT. Capital is the logarithm of fixed assets. LogGDP is the logarithm of GDP per capita. Tax difference is the difference between the tax rate of an affiliate and the tax rate of the other majority-owned affiliates within the same multinational, divided by the identified total number of affiliates within the same multinational. All regressions include an interaction term between a dummy variable for observations within a SOMNE and the tax differential variable. Regression (1)-(4) is an extension of the baseline model, represented by equation 3.11. These regressions include a dummy for observations above the 25th, 50th, 75th and 90th percentile, respectively, divided by the regulatory quality (RQ) indicator. In addition, an interaction term with the dummy multiplied by the tax differential is included. Regression (5) separates the regulatory quality indicator into four categories based on pre-defined quantiles, included as dummies and as separate interaction terms with the tax differential, represented by 3.12. Standard errors are clustered at the group level and reported in the parenthesis. ***, **, * respectively denotes 1, 5 and 10 per cent significance-level.*

The significance of the dummies indicating affiliates with host countries with higher regulatory quality suggests a significant difference between countries with lower and higher regulatory quality. An important implication when removing affiliates within a smaller multinational is that the median in our sample is equal to two affiliates within a multinational. Therefore, we cannot suggest that the results are driven by multinationals operating in similar levels of regulatory quality because the categories might be too narrow. With the reduction of approximately 40.6 per cent of the sample, the variation within the different categorizations has increased.

The results presented in Table 6.4 are the robustness check with the government effectiveness categorizations. The regression output from column (1) yields a similar output regarding the inclusion of affiliates operating in host countries with a government effectiveness score above the 25th percentile, both in the dummy and interaction term. However, the semi-elasticity for the control group (within the 25th percentile) is now insignificant. A possible explanation for this finding is that the variation within this control group is too small. The output from column (6) suggests a similar effect when including affiliates within the second category on the tax differential. The semi-elasticity has dropped from the 5 to the 10th per cent level.

Again, an implication is that the categorizations changes in Table 6.4 when the MNEs with the exclusion of multinationals with one affiliate only. The robustness check yields similar results to that of the main analysis (see Table 5.5). However, the categorizations might affect the results if they appear too narrow because of the drop in the sample size. Even though the results coincide with the previous model, the drop in observations raises a concern to what degree the categorizations are appropriate to investigate development. Moreover, the R-squared suggests that larger firms measured by their number of foreign affiliates explain more variation in EBIT.

Table 6.4: Robustness of Big Firms using Government Effectiveness

	(1) >25th	(2) >50th	(3) >75th	(4) >90th	(5) Categories
Capital	0.128***	0.128***	0.129***	0.128***	0.129***
	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)
logGDP	-0.486*	3.006***	-0.263	3.009***	-1.241***
	(0.253)	(0.207)	(0.570)	(0.210)	(0.331)
Tax differential	-1.251	0.414	1.166	0.941	0.308
	(1.239)	(1.069)	(0.986)	(0.963)	(1.083)
GE	0.843***	0.183	0.809**	0.273	
	(0.219)	(0.863)	(0.367)	(0.206)	
GE * taxdiff	2.742**	0.843	-2.092	-1.178	
	(1.083)	(1.167)	(1.509)	(1.678)	
State-Owned * taxdiff	0.453	0.390	0.482	0.462	0.550
	(1.757)	(1.785)	(1.686)	(1.741)	(1.749)
Category 2					0.789***
					(0.191)
Category 2 * taxdiff					1.612*
					(0.931)
Category 3					0.094
					(0.346)
Category 3 * taxdiff					0.339
					(1.441)
Category 4					0.581***
					(0.173)
Category 4 * taxdiff					-0.648
					(1.329)
N	14769	14769	14769	14769	14769
r2	0.086	0.085	0.085	0.085	0.085
ρ	0.850	0.938	0.839	0.936	0.887
Time FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes

Note:*The table reports the panel data estimation of affiliate-year observations from 2013 to 2020 with fixed industry and country effects. The dependent variable is the logarithm of EBIT. Capital is the logarithm of fixed assets. LogGDP is the logarithm of GDP per capita. Tax difference is the difference between the tax rate of an affiliate and the tax rate of the other majority-owned affiliates within the same multinational, divided by the identified total number of affiliates within the same multinational. All regressions include an interaction term between a dummy variable for observations within a SOMNE and the tax differential variable. Regression (1)-(4) is an extension of the baseline model, represented by equation 3.11. These regressions include a dummy for observations above the 25th, 50th, 75th and 90th percentile, respectively, divided by the government effectiveness (GE) indicator. In addition, an interaction term with the dummy multiplied by the tax differential is included. Regression (5) separates government effectiveness into four categories based on pre-defined quantiles, included as dummies and as separate interaction terms with the tax differential, represented by 3.12. Standard errors are clustered at the group level and reported in the parenthesis. ***, **, * respectively denotes 1, 5 and 10 per cent significance-level.*

7 Concluding Remarks

The existing profit shifting literature has provided insight into multinationals and their incentives to shift profits. Governments impact the global economy through their international presence across borders, and the objectives of SOMNEs influence the national economic status and competitiveness, particularly in developing economies. This study investigates whether SOMNEs weigh politics over profits and if their tax incentives are statistically different from other MNEs. Moreover, we aim to investigate if developing countries, characterized by low government effectiveness and regulatory quality, are more exposed to cross-border profit shifting. The analysis aims at contributing to a better understanding of how MNEs' behaviour differs between different levels of development.

Motivated by the scarce literature, our study aims to find if the level of development determines the magnitude of the response to a change in the tax differential between affiliates and investigate whether this response differs for multinationals where the state is the majority owner. Basing our investigation strategy on the methodology proposed by Huizinga and Laeven (2008) and replicating their model despite some limitations, we employed a panel data analysis on data from 2013 to 2020. Our baseline model could not identify a true relationship between the tax differential and reported EBIT. With the inclusion of regulatory quality and government effectiveness as proxies for a country's level of development, we found that affiliates operating in countries with higher government effectiveness and regulatory quality face a higher tax sensitivity relative to countries in the lower distribution. Interpreting this finding, an increase in the tax differential is associated with a higher reported EBIT in countries with relatively higher development, all else equal. This finding suggests a significantly different response to a change in the tax differential than that of the lower distribution.

Our results on differences between countries with different levels of development are consistent with results found by Johannesen et al. (2020). Our findings suggest that characteristics such as the commitment of the government to succeed with policies and the ability of the government to promote development can explain the development level. With higher development, the corporate tax system becomes more complex, imposing difficulties for multinationals when they shift profits to lower-taxed affiliates. As proposed by Huizinga and Laeven (2008), the multinational is proposed with a cost when manipulating transfer prices, which might explain that the perception of government intervention is an essential factor for multinationals' tax-planning strategies. The finding of an increasingly positive semi-elasticity with the level of development might suggest that costs incurred when the government interfere might not be compensated for in terms of the tax savings when shifting profits.

The effect of state ownership on the tax differential is not statistically different from that of other MNEs. This finding was persistent throughout the analysis, implying that we cannot identify a significant difference between multinationals with different ownership structures on the incentives to shift profits. Our results might have been affected by the limited data available on affiliates of SOMNEs and strict sampling restrictions.

Conducting robustness tests, one with an alternative to the tax differential and one excluding multinationals with one identified affiliate only, imply that our findings are robust. Although our findings of a significant difference between countries with relatively higher and lower development, proxied by the regulatory quality and government effectiveness, the study is exposed to limitations in terms of missing information on all affiliates within the multinationals. Moreover, due to the bias of the Orbis database towards European affiliates, our sample mainly consists of host countries with high or medium-high levels of development. Since the data is mainly on European firms, this might imply that the categories used in the analysis are too narrow.

We hope future research and data management initiatives address the limitations enlightened in this thesis. Due to the limitations, the baseline model cannot detect a true relationship between the tax differential and EBIT for the multinationals included in our sample selection. These limitations are discussed in Section 4 and throughout the relevant parts of the thesis. The main limitation is the incomplete and biased data for SOMNEs associated with firm-level financial data.

We could not obtain the cost of employees for all observations in our sample, which has been used as a proxy for labour in previous studies to identify the true profit for the affiliates. Further, we could not weigh the tax incentive because few affiliate observations would give biased estimates. Increasing the data availability would enable a weighted tax differential to be calculated for SOMNEs in more countries, which would increase the basis of comparison to other MNEs.

A more nuanced selection of countries in the sample could result in a better basis to compare the levels of development and give a better representation of the incentive to shift profits. The distribution consists of mainly European multinationals, thus countries in the developed part of the world. Countries that are likely to be engaged in profit shifting behaviour, such as Bermuda, Cayman Islands, and the Virgin Islands, are removed from the dataset due to lack of financial data. Further, we only included affiliates that were profitable in the sample selection. Adding loss-making affiliates in the sample selection to investigate whether loss shifting strategies would affect the estimates is also an area for further research.

In conclusion, increased transparency and stricter requirements for multinationals are necessary to detect more profit shifting behaviour and ensure a fair tax system. Based on our obtained results, we cannot conclude that SOMNEs weigh politics over profits, or the opposite, due to the insignificance of the point estimates. However, separating the observations into categorizations based on regulatory quality and government effectiveness suggests a significant difference between affiliates operating in host countries with higher development than affiliates in low development countries. In other words, higher development implies fewer incentives to shift profits.

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8 Appendix

A1 Extended Summary Statistics

Table A1.1: Extended Summary Statistics

	Mean	**SD**	**Median**	**Min**	**Max**	**N**
Firm characteristics						
FA	125339.4	1824361	1024	1	8.54e+07	24865
TA	188687.8.4	2481413	6836	0	1.10e+08	24865
Sales	131312.9	1332238	80502	-29	4.83e+07	24865
EBIT	10422.9	183486.3	493	1	1.39e+07	24865
LogEBIT	6.18	2.25	6.20	0	16.45	24865
Capital	6.87	3.10	6.92	6.931472	18.26	24865
Taxdiff	-.0005675	1.098915	0	-17.4955	8.504501	24865
Weighted tdiff	-.0020275	.0359969	0	-.2890176	.2269342	24865
Number of affiliates	8.28	17.86	2	1	104	24865
Country characteristics						
CIT	0.23	0.062	0.22	0	0.55	24865
GDP	29022.2	19447.12	25732.02	1449.61	123514.2	24865
LogGDP	10.01	0.80	10.16	7.28	11.72	24865
GNI	36388.85	14184.78	36200	4800	90320	24865
Unemployment	8.88838	4.9114	8.05	.25	29	24865
RQ	.9577546	.5633866	.9519957	-1.074257	2.260543	24865
GE	.9227677	.6190394	1.001175	-1.186608	2.236045	24865
Corruption Control	.7622853	.8375435	.64632	-1.1313	2.341601	24865

Table A1.2: Descriptive Statistics

Variable	Description	Source
Firm Characteristics		
FA	Fixed Assets	Orbis
TA	Total Assets	Orbis
Sales	Total Sales	Orbis
EBIT	Earnings before interest and tax	Orbis
LogEBIT	The log of EBIT, obtained from Orbis	Self-constructed
Capital	The log of fixed assets provided by Orbis	Self-constructed
Tax diff	Tax differential	Self-constructed
Weighted tdiff	Weighted tax differential	Self-constructed
Country Characteristics		
CIT	Satutory tax rate of the host country	KPMG
GDP	Gross domestic product	The World Bank
LogGDP	The log of GDP	The World Bank
GNI	Gross national income	The World Bank
Unemployment	Per cent of total labour force unemployed	Self-constructed
RQ	Regulatory Quality	The World Bank
GE	Government Effectiveness	The World Bank
Corruption Control	Control of corruption	The World Bank

Table A1.3: Statutory Tax Data 2013-2020

Country	**ISO code**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
United Arab Emirates	AE	55	55	55	55	55	55	55	55
Albania	AL	10	15	15	15	15	15	15	15
Argentina	AR	35	35	35	35	35	30	30	30
Austria	AT	25	25	25	25	25	25	25	25
Australia	AU	30	30	30	30	30	30	30	30
Bosnia-Hercegovina	BA	10	10	10	10	10	10	10	10
Belgium	BE	33.99	33.99	33.99	33.99	33.99	29	29	25
Bulgaria	BG	10	10	10	10	10	10	10	10
Brazil	BR	34	34	34	34	34	34	34	34
Bahamas	BS	0	0	0	0	0	0	0	0
Canada	CA	26	26.5	26.5	26.5	26.5	26.5	26.5	26.5
Chile	CL	20	20	24	24	25.5	26	27	27
China	CN	25	25	25	25	25	25	25	25
Colombia	CO	25	25	25	25	34	33	33	32
Czech Republic	CZ	19	19	19	19	19	19	19	19
Germany	DE	29.55	29.58	29.72	29.72	29.79	30	30	30
Denmark	DK	25	24.5	22	22	22	22	22	22
Estonia	EE	21	21	20	20	20	20	20	20
Egypt	EG	25	25	22.5	22.5	22.5	22.5	22.5	22.5
Spain	ES	30	30	28	25	25	25	25	25
Finland	FI	24.5	20	20	20	20	20	20	20
Frace	FR	33.33	33.33	33.33	33.33	33.33	33.33	31	28
United Kingdom	GB	23	21	20	20	19	19	19	19
Ghana	GH	25	25	25	25	25	25	25	25
Greece	GR	26	26	29	29	29	29	28	24
Hong Kong	HK	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5
Croatia	HR	20	20	20	20	18	18	18	18
Hungary	HU	19	19	19	19	9	9	9	9
Israel	IL	25	26.5	25	25	24	23	23	23
India	IN	33.99	33.99	34.61	34.61	34.61	35	30	30
Iceland	IS	20	20	20	20	20	20	20	20
Italy	IT	31.4	31.4	31.4	31.4	24	24	24	24
Japan	JP	38.01	35.64	33.86	30.86	30.86	30.86	30.62	30.62
South Korea	KR	24.2	24.2	24.2	24.2	22	25	25	25
Lithuania	LT	15	15	15	15	15	15	15	15
Luxembourg	LU	29.22	29.22	29.22	29.22	27.08	26.01	24.94	24.94
Latvia	LV	15	15	15	15	15	20	20	20
Morocco	MA	30	30	31	31	31	31	31	31
Moldova	MD	12	12	12	12	12	12	12	12
Montenegro	ME	9	9	9	9	9	9	9	9
North Macrdonia	MK	10	10	10	10	10	10	10	10
Malta	MT	35	35	35	35	35	35	35	35
Mauritirus	MU	15	15	15	15	15	10	15	20
Mexico	MX	30	30	30	30	30	30	30	30
Malaysia	MY	25	25	24	24	24	24	24	24
Nigeria	NG	30	30	30	30	30	30	30	30
Netherlands	NL	25	25	25	25	25	25	25	25
Norway	NO	28	27	27	25	24	23	22	22
New Zealand	NZ	28	28	28	28	28	28	28	28
Peru	PE	30	30	28	28	29.5	29.5	29.5	29.5
Philippines	PH	30	30	30	30	30	30	30	30
Poland	PL	19	19	19	19	19	19	19	19
Portugal	PT	25	23	21	21	21	21	21	21
Romania	RO	16	16	16	16	16	16	16	16
Serbia	RS	15	15	15	15	15	15	15	15
Sweden	SE	22	22	22	22	22	22	21.4	21.4
Singapore	SG	17	17	17	17	17	17	17	17
Slovenia	SI	17	17	17	17	19	19	19	19
Slovakia	SK	23	22	22	22	21	21	21	21
Thailand	TH	20	20	20	20	20	20	20	20
Turkey	TR	20	20	20	20	20	22	22	22
Ukrain	UA	19	18	18	18	18	18	18	18
United States	US	40	40	40	40	40	27	27	27
Uruguay	UY	25	25	25	25	25	25	25	25
Vietnam	VN	25	22	22	22	20	20	20	20

Table A1.4: Correlation Matrix

	logEBIT	Capital	taxdiff	logGDP	CIT	GNI	CC	RQ	GE	Unemployment
logEBIT	1.00									
Capital	0.68***	1.00								
taxdiff	0.04***	0.04***	1.00							
logGDP	0.09***	0.06***	0.17***	1.00						
CIT	0.14***	0.13***	0.53***	0.38***	1.00					
GNI	0.10***	0.07***	0.18***	0.94***	0.34***	1.00				
CC	0.11***	0.07***	0.15***	0.83***	0.31***	0.85***	1.00			
RQ	0.09***	0.06***	0.08***	0.84***	0.18***	0.83***	0.91***	1.00		
GE	0.13***	0.08***	0.17***	0.84***	0.36***	0.82***	0.93***	0.88***	1.00	
Unemployment	-0.09***	-0.05***	0.06***	-0.05***	0.11***	-0.19***	-0.17***	-0.18***	-0.14***	1.00
N	24865									

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: *The table reports the correlation between firm- and country-specific variables. LogEBIT is the logarithm of earnings before interest and tax. Capital is the logarithm of fixed assets. Taxdiff is the tax differential between an affiliate in one host county and an affiliate in a different host country within the same multinational firm, divided by the total number of affiliates identified within the multinational. logGDP is the logarithm of GDP per capita. CIT is the statutory tax rate of a host country. GNI, CC (control of corruption), RQ, GE and Unemployment are country variables.*

Table A1.5: Industries

Industry	Number of Observations	State-Owned	Other
Agriculture, forestry and fishing	192	0	192
Mining and quarrying	137	58	79
Manufacturing	5901	81	5820
Electricity, gas, steam and air	1122	493	629
Water supply	166	30	136
Construction	604	31	573
Wholesale and retail trade	7880	187	7693
Transportation and storage	1368	392	976
Accomodation and food service	470	12	458
Information and communication	1598	54	1544
Financial and insurance activities	608	33	575
Real estate activities	1465	78	1387
Professional, scientific and tech	1959	122	1837
Administrative and support service	1009	52	957
Education	108	13	95
Human, health and social work	119	0	119
Arts, entertainment and recreation	91	8	83
Other service activities	68	8	60

Table A1.6: Number of Subsidiaries by World Region

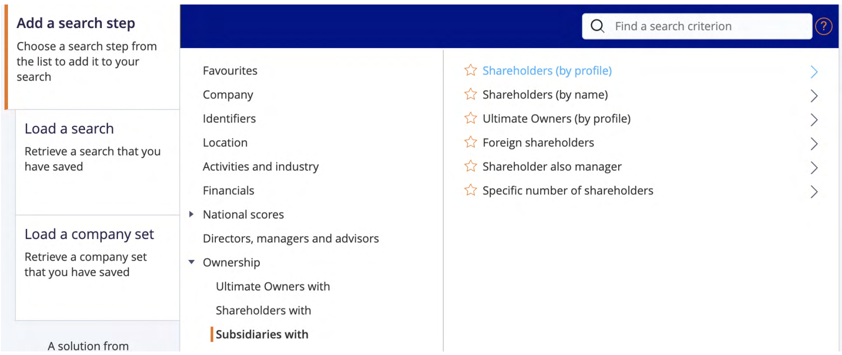
World Region	**Subsidiaries**
Africa	118
Eastern Europe	7 889
East and Central Asia	1586
Middle East	1
Oceania	50
South and Central America	309
Western Europe	11 177

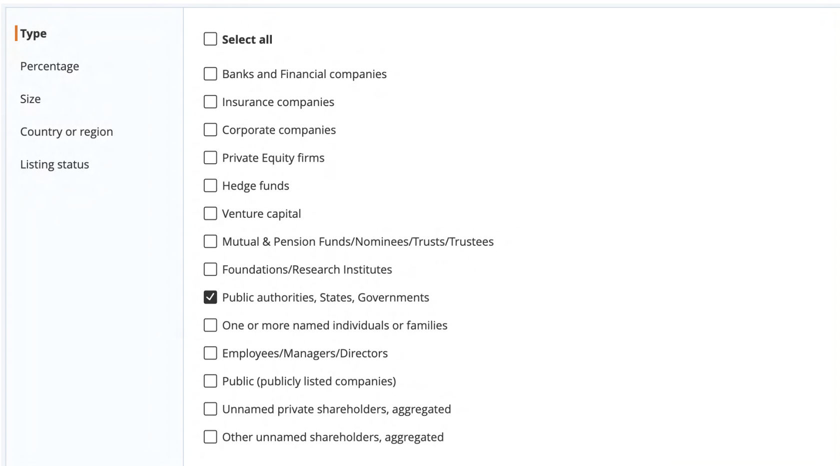
Table A1.7: Number of Affiliates per Country

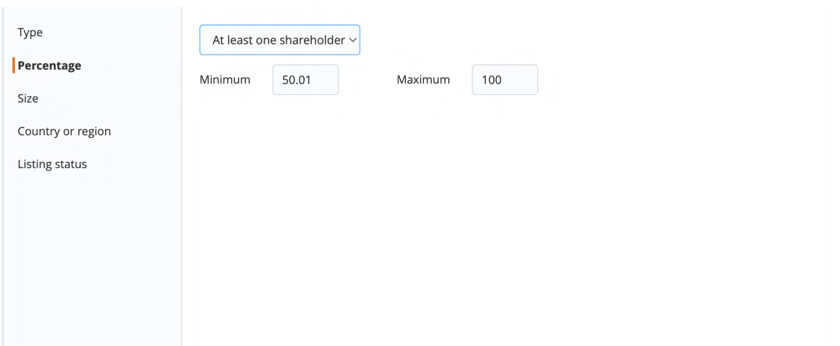
Country	Iso Code	Number of Affiliates
United Arab Emirates	AE	1
Albania	AL	5
Argentina	AR	6
Austria	AT	244
Australia	AU	7
Bosnia-Hercegovina	BA	166
Belgium	BE	882
Bulgaria	BG	368
Brazil	BR	82
Bahamas	BS	7
Canada	CA	10
Chile	CL	8
China	CN	479
Colombia	CO	279
Czech Republic	CZ	935
Germany	DE	877
Denmark	DK	117
Estonia	EE	442
Egypt	EG	6
Spain	ES	1984
Finland	FI	459
Frace	FR	2141
United Kingdom	GB	20
Ghana	GH	7
Greece	GR	135
Hong Kong	HK	60
Croatia	HR	498
Hungary	HU	777
Israel	IL	9
India	IN	353
Iceland	IS	32
Italy	IT	2250
Japan	JP	62
South Korea	KR	167
Lithuania	LT	270
Luxembourg	LU	71
Latvia	LV	465
Morocco	MA	130
Moldova	MD	19
Montenegro	ME	35
North Macrdonia	MK	37
Malta	MT	36
Mauritirus	MU	3
Mexico	MX	20
Malaysia	MY	412
Nigeria	NG	8
Netherlands	NL	258
Norway	NO	1085
New Zealand	NZ	53
Peru	PE	19
Philippines	PH	25
Poland	PL	1644
Portugal	PT	977
Romania	RO	1384
Serbia	RS	457
Sweden	SE	1652
Singapore	SG	8
Slovenia	SI	276
Slovakia	SK	841
Thailand	TH	278
Turkey	TR	8
Ukrain	UA	348
United States	US	18
Uruguay	UY	2
Vietnam	VN	160

A2 Obtaining Data in the Orbis Database

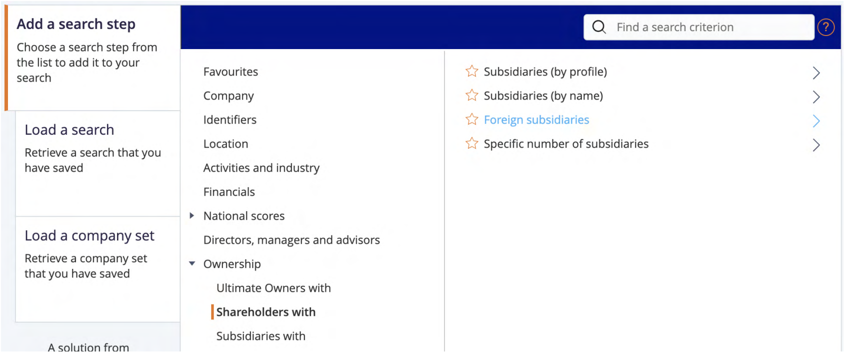
Step 1 - To obtain data on state-owned enterprises, we use the Orbis database. To choose state-owned shareholders, choose (Ownership - Subsidiaries with - Shareholders (by profile)). As we study state-owned enterprises, we select (Type - Public authorities, States, Governments) (Percentage - At least one shareholder - Minimum 50.01 - Maximum 100).

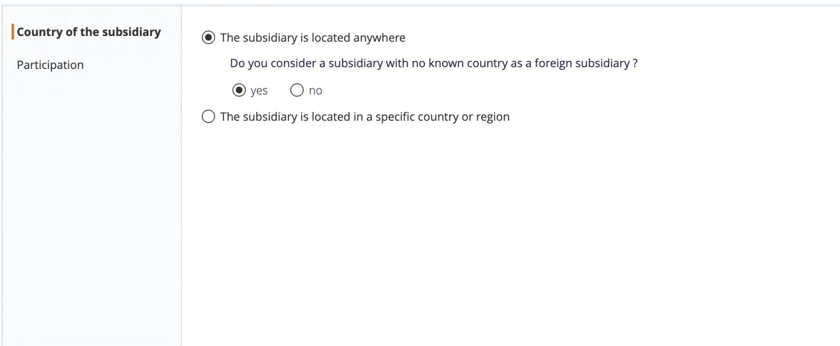


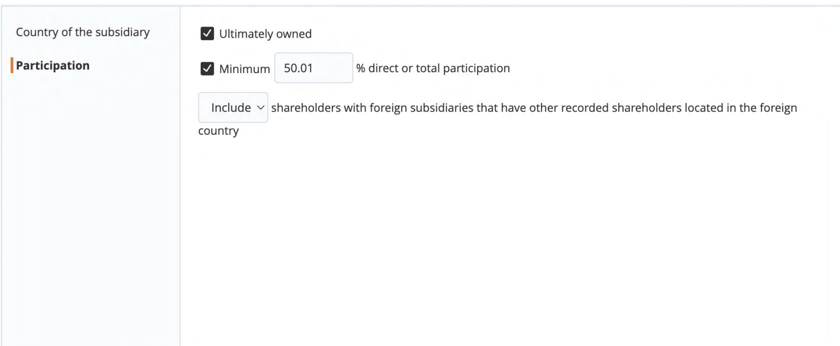




Step 2 - Secondly, in order to select only multinational firms, we select (Ownership - Shareholders with - Foreign subsidiaries) and then (The subsidiary is located anywhere, including subsidiaries with no known country as a foreign subsidiary) and (participation minimum 50.01 per cent direct or total participation).



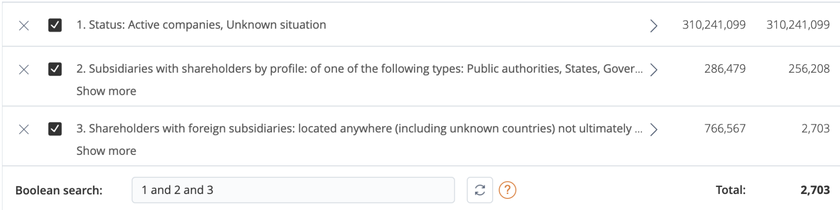


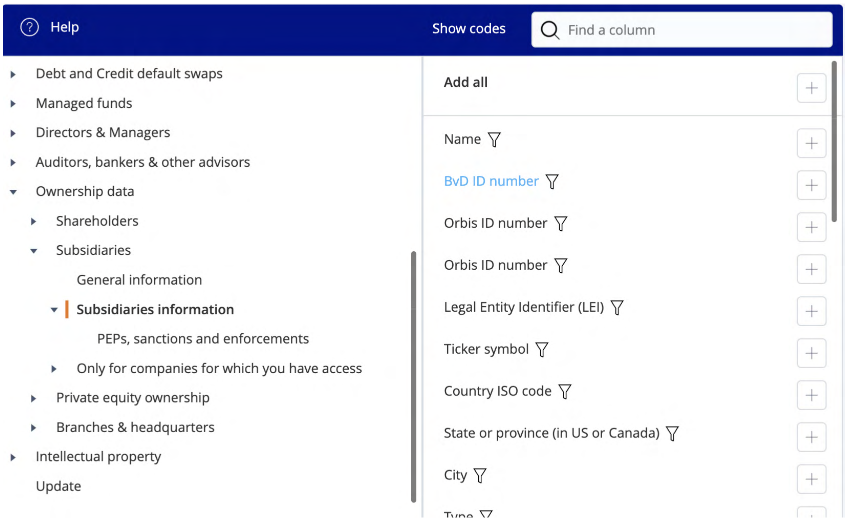


After trimming the data only to include state-owned multinationals, we now have the search strategy for the firms in the sample.

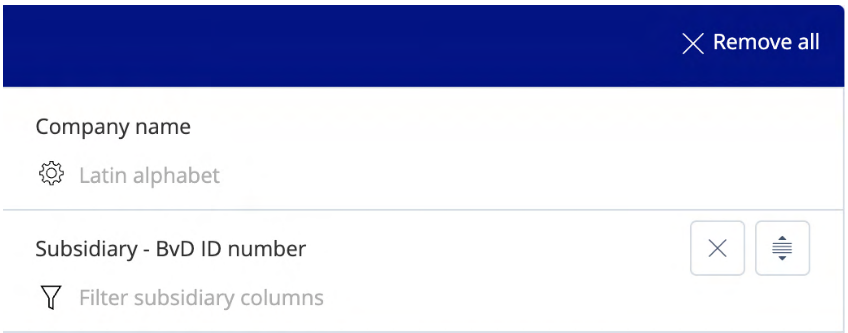
Step 3 - Choose unconsolidated financial statements

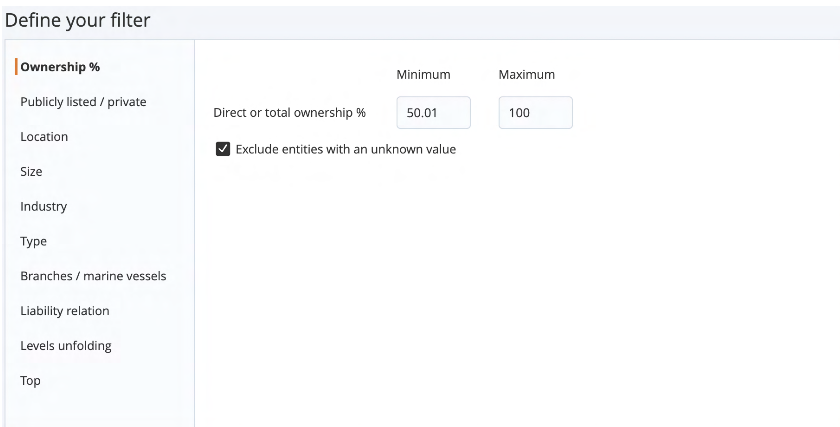
Step 4 - To view the list of the state-owned multinationals' subsidiaries, we choose "View list of results" and "Add/remove columns". By choosing "Remove all" in order to find the columns necessary. Firstly, the only column we need is the BvD ID numbers of foreign subsidiaries (Ownership data - Subsidiaries - Subsidiaries information - BvD ID number)

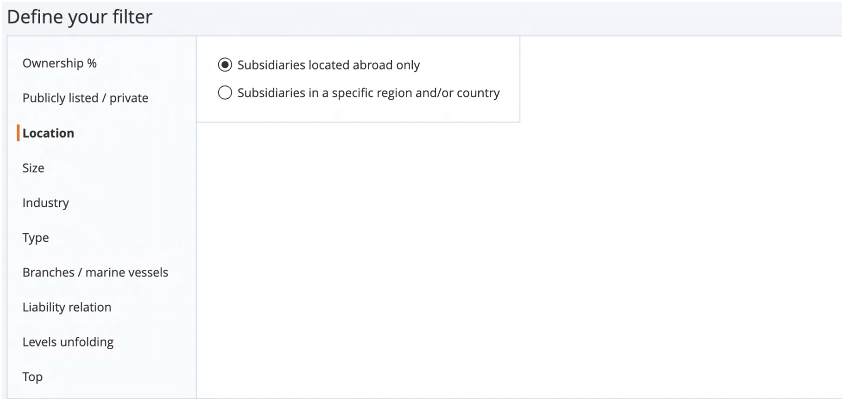


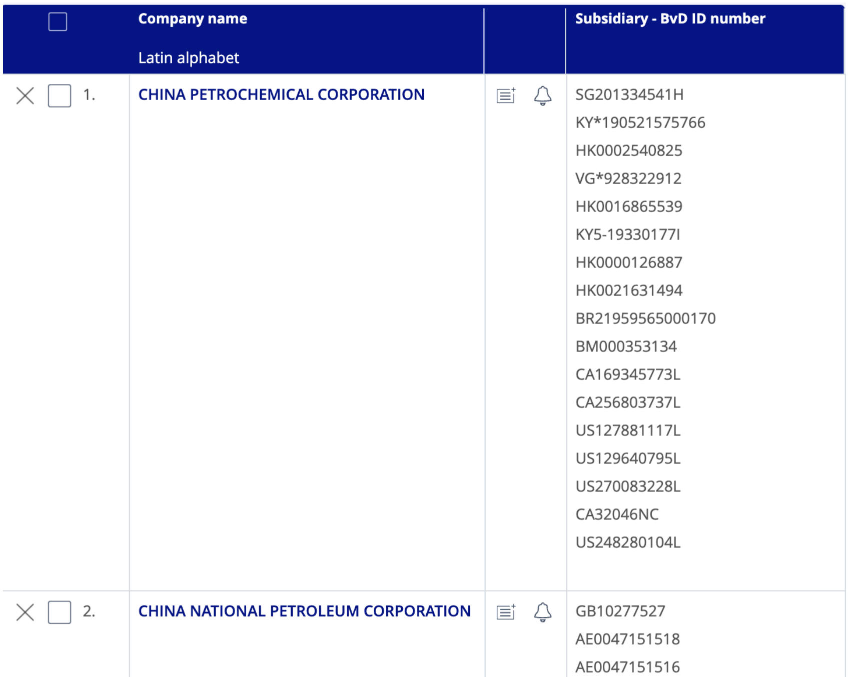


Moreover, we filter the subsidiary column (Ownership minimum 50.01 per cent maximum 100 per cent, excluding entities with an unknown value) and (Location - Subsidiaries located abroad only), and apply.



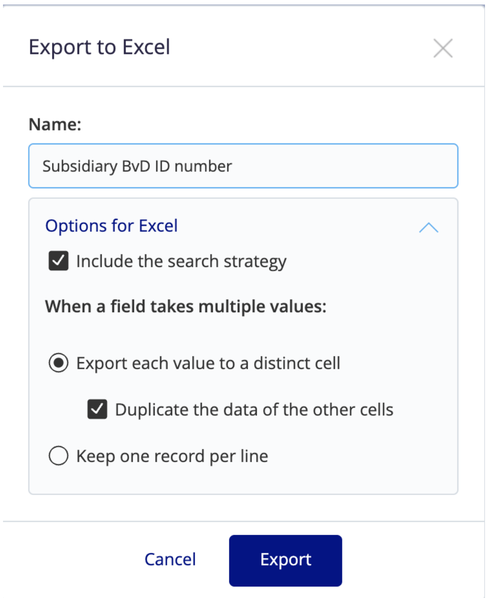




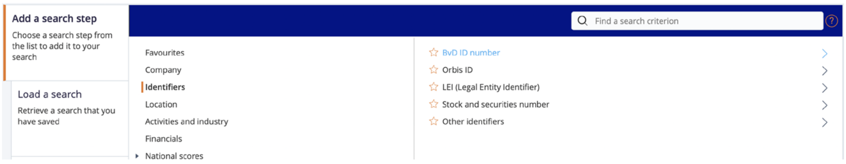


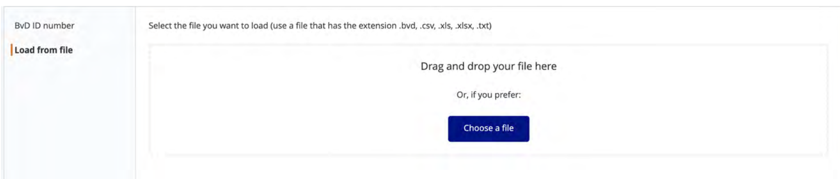
	Company name Latin alphabet		Subsidiary - BvD ID number
1.	CHINA PETROCHEMICAL CORPORATION		SG201334541H KY*190521575766 HK0002540825 VG*928322912 HK0016865539 KY5-193301771 HK0000126887 HK0021631494 BR21959565000170 BM000353134 CA169345773L CA256803737L US127881117L US129640795L US270083228L CA32046NC US248280104L
2.	CHINA NATIONAL PETROLEUM CORPORATION		GB10277527 AE0047151518 AE0047151516

The obtained list of foreign subsidiaries with parent companies can now be exported to Excel in the "Export" tab. By choosing the option "Excel" and "Options for Excel," we can export each value to a distinct cell in Excel by duplicating the data of the other cells.

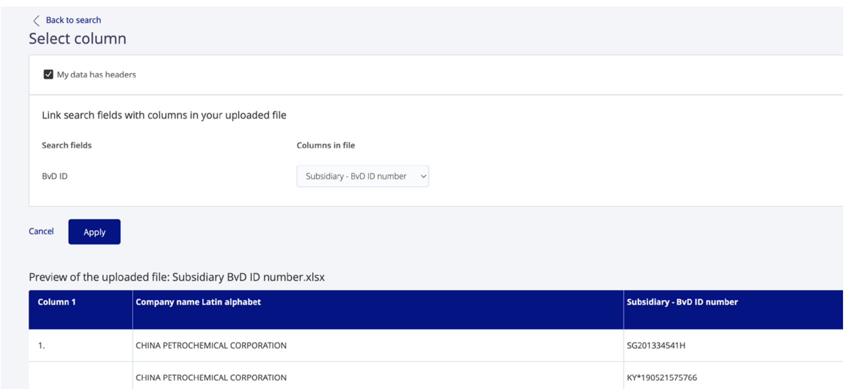


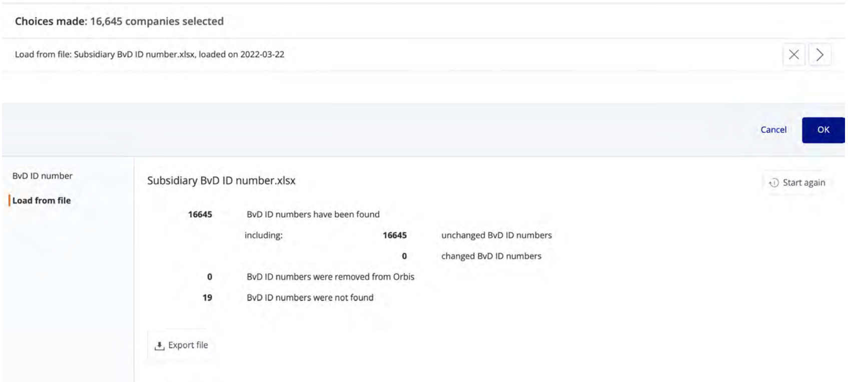
Step 5 - The next step is to obtain the necessary data on the foreign subsidiaries. This is done by uploading the excel file with the subsidiary BvD ID numbers by choosing (Identifiers - BvD ID number).



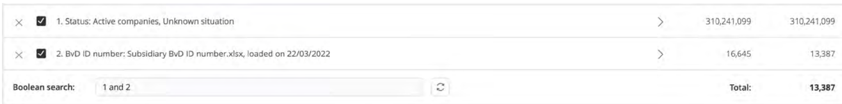


Upload the data by choosing the column with "Subsidiary - BvD ID number" and choosing "My data has headers".





The data sample is now restricted to the BvD ID numbers uploaded.



Step 6 - Lastly, we need to obtain the necessary variables to conduct the empirical analysis. By repeating Step 3 and choosing to add columns on the BvD ID number of the firm, the NACE-code, ISO-country code, shareholder BvD ID number etc. and downloading the dataset to Excel.