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## **The case of taxing multinational corporations in Uganda**

Do multinational corporations face lower effective tax rates and  
is there evidence for profit shifting?

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**Abstract:** We study how large domestic firms and multinational corporations compare in their effective tax rates and whether there is evidence of profit shifting out of Uganda. Using administrative data from the Uganda Revenue Authority and regression analysis, we find that multinational corporations lower their corporate tax burden through two channels: lower effective tax rates and profit shifting. Multinational corporations pay lower effective tax rates, by approximately 20 percentage points, on their reported profits than large domestic corporations because of tax treaties and other benefits. However, they are also more likely to report losses than domestic firms. This is likely due to profit shifting, as we observe that the lower the tax rate in the country of the global owner, the lower the reported profit of the multinational corporation in Uganda. Developing countries are particularly vulnerable to profit shifting, given their limited fiscal capacity. Thus, the profit-shifting behaviour of multinational corporations creates substantial challenges for achieving sustainable development through strengthening domestic revenue mobilization. This study is among the first to provide evidence of profit shifting by multinational corporations in a low-income country setting.

**Key words:** multinational corporations, profit shifting

**JEL classification:** F63, H25, H26, O23

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## 1 Introduction

This paper studies the extent and implications of profit shifting in Uganda. Using administrative data from the Uganda Revenue Authority (URA n.d.), we show that multinational corporations (MNCs) avoid corporate taxation in Uganda through a two-fold mechanism. First, the MNCs have lower effective tax rates than large domestic corporations. Second, we find suggestive evidence of profit shifting, as we observe that lower tax rates in the countries of global owners are associated with lower reported profits in Uganda. Moreover, when controlling for corporate characteristics such as fixed capital and labour costs, MNCs are more likely to report losses in Uganda.

Sustainable Development Goal 17.1 highlights the need to strengthen domestic resource mobilization to improve capacity for revenue collection. However, profit shifting and other tax avoidance behaviours create challenges for governments to increase revenue collection. Given the lower fiscal capacity of developing countries, profit-shifting behaviour hinders the achievement of sustainable development goals. Increasing revenue collection in developing countries improves the stability of the funding structure of public services and enables capacity building of the public sector, making countries less dependent on aid.

Global tax avoidance scandals, such as the ‘Panama Papers’ have shown that profit shifting is prevalent across the world, resulting in estimated annual tax revenue losses of US\$200–600 billion.<sup>1</sup> Studies from high- and middle-income countries have brought more knowledge on the matter, while the exact impact of profit shifting in low-income countries is still unknown. Evidence on profit shifting by MNCs in Uganda and other developing countries is still scarce. Moreover, many low-income countries have adopted selective tax incentives—often tax exemptions—to attract private investment (Gauthier and Reinikka 2006). Abramovsky et al. (2018) suggest that all the exemptions and benefits offered by developing countries may be unnecessary. Like many other developing countries,<sup>2</sup> Uganda gives several tax benefits, such as exemptions, ‘tax holidays’, and special one-to-one arrangements, that can effectively reduce the tax burden of MNCs. Such benefits leave room for another channel for tax avoidance on top of profit shifting.

This triggers the hypothesis of a dual mechanism through which potential tax revenue from MNCs is forgone. First, MNCs actively engage in profit shifting and, second, they face a lower effective tax rate on the remaining taxable income. To close potential loopholes and provide an estimate of potential profit shifting, it is important to better understand the characteristics of MNC affiliates compared to those of large domestic firms in Uganda.

Our detailed data from Uganda allows us to shed light on MNCs’ tax avoidance mechanisms in a low-income economy. We combine corporate income tax filing data from the URA (URA n.d.) for the fiscal years 2010/11 to 2017/18 with information about MNCs obtained from the commercial firm-level Orbis database and public source data. This unique panel dataset allows us to provide one of the first estimates of the extent of profit shifting and its effects on revenue in a low-income country. Uganda is a largely informal economy where, according to estimates by McKay et al. (2019), about 70 per cent of those working outside of the public sector and subsistence farming are considered to be informally employed. Therefore, tax revenues from large corporations play a major role in building and broadening the tax base. Over the past decade, Uganda’s aims to increase tax revenue have been fruitful apart from in the corporate income tax

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<sup>1</sup> Beer et al. (2019), Crivelli et al. (2016), and Cobham and Janský (2018) provide a review of the literature.

<sup>2</sup> See e.g. Mascagni and Mengistu (2019) for Ethiopia and Gauthier and Gersovitz (1997) for Cameroon.

base. While revenue from other tax bases has increased, corporate tax revenue has stagnated. A likely cause for this is profit shifting and other types of tax avoidance.

We start by estimating the effective tax rates of MNCs and large domestic corporations to study whether MNCs pay lower taxes because of treaties and tax benefits. Earlier research by Gauthier and Reinikka (2006) and Maweje and Okumu (2016) showed that tax evasion of business taxes and formal exemptions have been prevalent in Uganda. Uganda provides several tax benefits such as exemptions, ‘tax holidays’, and special one-to-one arrangements for corporations, for example based on the country of global ownership. By estimating the effective tax rates of large corporations, we find that MNCs clearly pay lower effective tax rates on their reported profits than large domestic firms.

Second, we use regression analysis to study the extent to which MNCs report profits in Uganda and find that a lower tax rate in the global owner’s country is associated with lower reported profits in Uganda. In addition, MNCs are more likely to report losses in Uganda compared to domestic firms when controlling for several corporate characteristics. In the regression analysis, we extend the method used by Hines and Rice (1994) and applied by Wier and Reynolds (2018) for an upper middle-income economy. In this identification strategy, firm profits depend on the inputs, capital, labour, and the industry of the firm, while the tax rate in the country of the parent company should not affect the profitability of the firm. If the taxable profits of local Ugandan subsidiaries of MNCs with global ultimate ownership in a low tax country differ from those of other MNCs or large domestic firms, this is likely to be due to profit shifting.

To identify profit-shifting incentives, we apply two different explanatory variables. First, we use a binary indicator of global ultimate ownership in a tax haven, as in Wier and Reynolds (2018), and second, the difference in statutory tax rates in Uganda and the country of the global ultimate owner to capture profit-shifting incentives. We use the statutory tax rate instead of the potentially more accurate effective tax rate because, while the statutory rate represents the general level of corporate income taxation in a country, the effective tax rate also captures local firm-specific responses such as financing structure, effort, and informality, potentially creating an endogeneity issue. Moreover, we identify aggressive profit shifting using two different dependent variables. First, we study the effect on reported profit and, second, we use a binary variable to capture the effect on the probability of reporting zero and negative profits, as in Johannesen et al. (2019). We also use this regression analysis to compare MNCs to large domestic firms.

Johannesen et al. (2019) showed that when MNC affiliates face lower tax rates in the country of their global ultimate owner, they are more likely to report zero profits, and the effect is stronger in less-developed countries. Like Johannesen et al. (2019), other recent micro literature on profit shifting has mainly used firm-level data from the commercial Orbis database maintained by Bureau van Dijk (2019). However, the data only contains limited financial information for developing countries. For example, in Johannesen et al. (2019), the effect arises largely from a comparison between Western and Eastern Europe, whereas we provide a comprehensive case study from a low-income country.<sup>3</sup> Moreover, many other existing studies on the matter use domestic tax rate differences and changes as a variation to estimate the extent of profit shifting.<sup>4</sup> Such studies struggle with the endogeneity concern that tax rate changes may also impact other decision margins such as incentives for investment. In addition, our data, which covers the years 2011 to 2018, is

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<sup>3</sup> Even the poorest Eastern European country is categorized as an upper middle-income economy by the World Bank.

<sup>4</sup> E.g. Desai et al. (2004) and Huizinga et al. (2008). Heckemeyer and Overesch (2017) provide a quantitative review of the empirical profit-shifting literature.

relatively recent, providing new and up-to-date information on issues related to profit shifting in a developing country.

This study is one of the first to estimate the extent of tax avoidance by MNCs and its effects on revenue in a low-income country. Evidence from Uganda provides wider knowledge on the differential challenges low-income countries face in the matter and enables the global estimates of profit-shifting losses to be amplified. We provide a detailed analysis of the characteristics of MNC affiliates compared to domestic Ugandan firms, estimate the effective tax rates for MNC affiliates versus domestic firms and, finally, provide estimates of the scale of MNCs' tax-motivated profit shifting out of Uganda. In so doing, this study makes four important contributions to the literature. First, it is one of the first studies to use tax administrative data to estimate effective tax rates in a low-income country; similar estimations of effective tax rates exist for different firm sizes and sectors in Ethiopia (Mascagani and Mengistu 2019). Second, this study contributes to the profit-shifting literature with new evidence on developing countries. Third, it extends the methods used by Wier and Reynolds (2018) and Johannesen et al. (2019), while highlighting the importance of domestic tax avoidance channels. Finally, this study provides a comprehensive overview for policy makers of the areas that may require attention in the efforts to close tax loopholes and mobilize domestic resources in developing countries.

The remainder of this paper is structured as follows. The next section provides an overview of Uganda's corporate tax system, and Section 3 describes the data. Section 4 introduces the method, and Section 5 presents the results. Section 6 concludes.

## **2 Background on Ugandan tax system**

### **2.1 Ugandan corporate income tax system**

Corporate income taxes are administered centrally by the URA and the Ministry of Planning and Economic Development. The URA divides taxpayers into three categories: large taxpayers, medium taxpayers, and small taxpayers. In this study, we focus on the large taxpayers and corporate income tax. A large corporate taxpayer must submit a return for the tax period using an online system. The financial year runs from 1 July to 30 June and taxpayers are expected to submit their tax return six months later, so that the due date is 31 December of the same year. However, a taxpayer can apply to have a different income year running from 1 January to 31 December, in which case the return is due by 30 June of the next year.

Corporations in Uganda pay corporate income tax based on their net income. Companies resident<sup>5</sup> in Uganda are liable for tax based on their worldwide income and gains, while non-residents are taxed only on income sourced in Uganda. The corporate income tax rate is 30 per cent, except for mining companies,<sup>6</sup> non-resident air transport,<sup>7</sup> and shipping, oil, and gas companies,<sup>8</sup> which are

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<sup>5</sup> For a year of income, a company is resident if: 1. it is incorporated under the laws of Uganda; 2. at any time in the year of income, its management and control are exercised in Uganda; 3. it undertakes most of the operations in Uganda during a year of income.

<sup>6</sup> Mining companies: non-resident firms pay withholding tax on payments received but if they operate as a branch or permanent establishment within the country, then they pay branch profit tax under section 82 of the Income Tax Act.

<sup>7</sup> The tax rate for non-resident taxpayers in shipping and aircrafts is 2 per cent, while residents are exempt.

<sup>8</sup> The oil industry operates under a licensing system according to which the companies pay a royalty on oil production, the state claims a share on the 'profit oil', and corporate income tax is paid on the final profit.

liable for additional royalty payments or are granted exemptions. In addition, resident companies with a turnover below UGX150 million<sup>9</sup> are charged according to the presumptive tax provision. However, these small firms are not included in our study.

The corporate income tax regime in Uganda<sup>10</sup> aims to support investment through tax holidays, exemptions, and benefits, thereby decreasing the effective tax rates on some firms' corporate income. The biggest share of foreign direct investment (FDI) in Uganda is focused on banking, insurance, the petroleum sector, energy, mining, telecommunication, real estate, and agro-exports. In addition, the Minister of Finance has powers to grant tax exemptions to firms and non-governmental organizations on an ad hoc basis (that is, with no specific rules or criteria for granting exemptions) using statutory instruments. Selected firms receive exemptions from corporate income tax, import duties, and domestic sales taxes on a case-by-case basis. These exemptions and special treatments in the tax system are likely to create channels for avoiding corporate income tax. In recognition of the negative effect of special regimes on equity, tax administration efficiency, and revenues, attempts have been made to curtail the extent of such exemptions (Gauthier and Reinikka 2006; SEATINI 2017).

A key component of the system affecting corporate income tax revenue is the double tax agreement (DTA) regime. Uganda has DTAs with several countries to prevent the double taxation of multinational entities. These treaties are also common in other sub-Saharan African countries and the earliest treaty with Uganda dates back to 1919. Their aim is to promote FDI and avoid corporate income tax evasion. However, the controversy of the double tax treaties is that net capital importing countries, such as Uganda, usually bear most of the costs of such treaties as the treaties largely hinder the taxing of inward investment.<sup>11</sup> Therefore, as discussed by Hearson and Kangave (2016), the treaties effectively provide a means for tax avoidance. Uganda currently has DTAs in place with Denmark, India, Italy, Mauritius, the Netherlands, Norway, South Africa, the UK, and Zambia.<sup>12</sup> As a result of the debate about the drawbacks of the treaties, some of the deals are now under renegotiation.

The creation of the URA and modernization of taxation processes in recent decades have been accompanied by increases in total revenue and in the revenue-to-GDP ratio in Uganda. The total revenue collection performance over the years is shown in Figure 1. While the figure shows a significant growth in tax revenue, Figure 2 shows that the corporate income tax contribution relative to net collections and direct taxes declined from 11 per cent in 1991/92 to 6 per cent in 2016/17 and from 86 per cent to 19 per cent, respectively. The modest development of corporate income tax revenue suggests that, despite the development of the URA, there seem to be loopholes in the corporate tax system.

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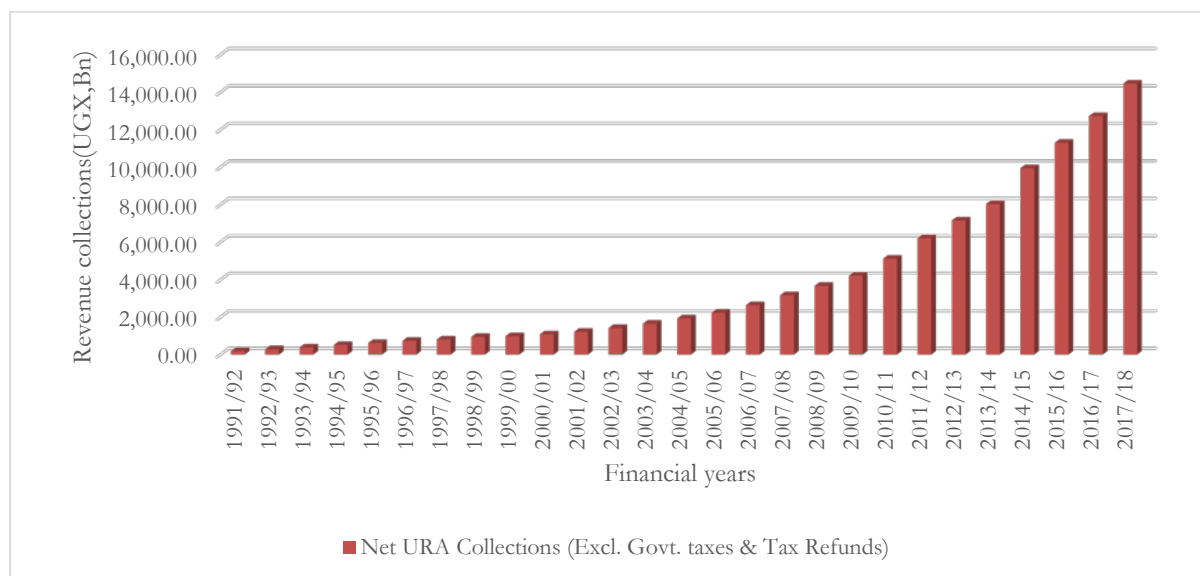
<sup>9</sup> UGX150 million was approximately €35,000 in 2019, when €1 was approximately UGX4100 in October 2019

<sup>10</sup> Income Tax Act.

<sup>11</sup> Hearson and Kangave (2016) provide more details for Uganda.

<sup>12</sup> Mauritius and some UK territories are also considered tax havens.

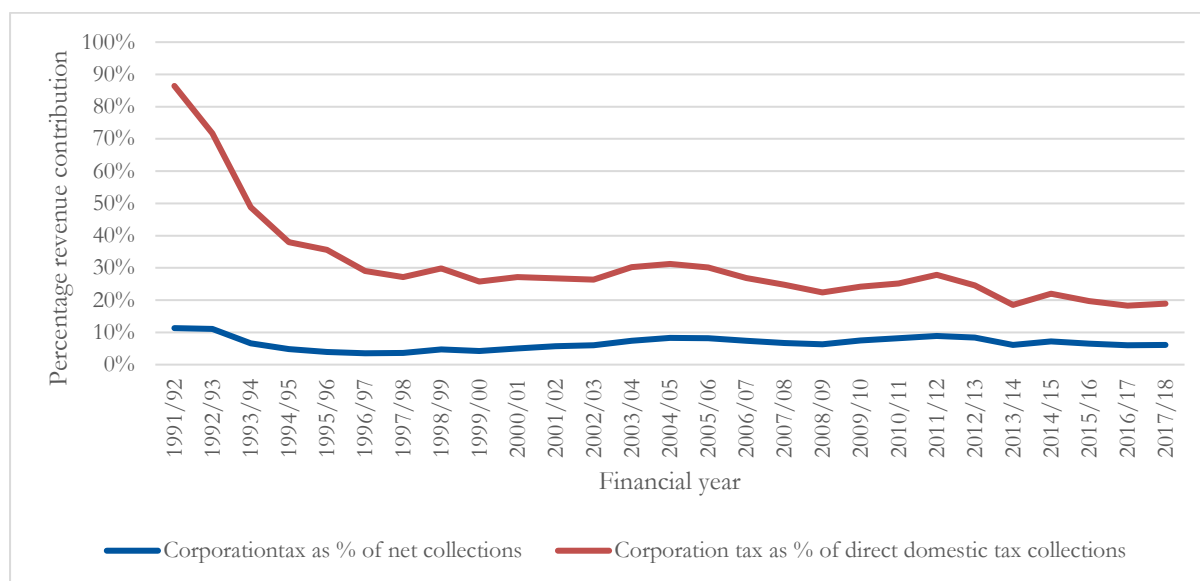
Figure 1: Tax revenue collection in Uganda 1992–2018



Note: this figure plots the nominal revenue collection in Uganda for 1992–2018.

Source: authors' own estimations based on URA administrative data.

Figure 2: Corporate tax revenue



Note: this figure plots the share of corporate tax revenue in net tax collections and direct domestic tax collections.

Source: authors' own estimations based on URA administrative data.

## 2.2 Profit shifting and Uganda

The international tax literature recognizes two main channels for profit shifting: thin capitalization and transfer pricing. Thin capitalization is when the internal debts of a multinational group are used to relocate profits to a low tax jurisdiction. The subsidiary in a higher tax jurisdiction is positioned to hold a high level of the group's internal debt to allow the interest payments to the foreign affiliate to be deducted. In this way, the MNC reduces its reported pre-tax profits in the high tax jurisdiction. In transfer pricing, the MNC uses the internal prices of transactions between

entities within the same multinational group to move profits from a high tax jurisdiction to a low tax jurisdiction.

Ugandan income tax law allows taxpayers to deduct part of the interest incurred on loan repayments when paying their taxes. A company may therefore prefer to use debt finance in order to take advantage of interest deductions. This law creates a channel for profit shifting using the MNC's internal debts to relocate profits. This channel has recently been hindered, however. On 1 July 2018, Uganda introduced an amendment to replace the thin capitalization rules. Uganda now limits the amount of deductible interest for debts liable to taxpayers who are a member of a group to 30 per cent of tax earnings before interest tax, depreciation, and amortization (EBITDA). If a taxpayer's interest exceeds 30 per cent of the tax EBITDA, it can carry forward the excess interest for a maximum of three years. This amendment was only introduced after the end of our research period and it would be interesting to analyse it in future research. To curb transfer pricing, Uganda has applied the arm's length principle since 2011.

### 3 Data and descriptive statistics

#### 3.1 Data

This study is based on administrative data for large taxpayers<sup>13</sup> from the URA for the fiscal years 2010/11<sup>14</sup> to 2017/18 and on data from the Orbis commercial firm-level database maintained by Bureau van Dijk (2019). The administrative data used in this analysis has four components: the non-individual TIN (Tax Identification Number) register data,<sup>15</sup> the large taxpayer office (LTO) register data,<sup>16</sup> non-individual (corporate income) tax return data,<sup>17</sup> and corporate income tax payments data, which are all merged into a unique panel dataset.

In the process of merging these components, some simplifications and assumptions had to be made. The LTO register data is available for the date of extraction but not for each fiscal year. As the URA periodically, but not systematically, reclassifies firms into or out of the large taxpayers' office, there is a reason to assume that the LTO register contains different firms over time. However, the most recent LTO register is thought to be a good proxy of firms handled by the LTO during the earlier fiscal years. Similarly, the non-individual TIN register is only available for the date of extraction and is continuously updated. This means that those firms that did not survive until the final period of this study have been excluded from the analysis, as their TIN has been de-registered and removed from the register.<sup>18</sup>

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<sup>13</sup> The URA maintains a set of criteria and updated the set of criteria for what qualified a taxpayer to be considered a large taxpayer handled by the LTO in 2015 and 2017. According to the criteria effective from July 2017, the large taxpayers' office handles taxpayers whose turnover is equal to or greater than UGX23 billion and who have an asset base of UGX30 billion or revenue contribution of UGX2 billion in a financial year. There are also some sector-specific criteria.

<sup>14</sup> E-filing was gradually introduced in 2009, so that the 2010/11 fiscal year is the first full period for which e-filing records are available.

<sup>15</sup> The TIN register data was extracted on 4 May 2018.

<sup>16</sup> The LTO register data was extracted on 13 July 2018.

<sup>17</sup> Non-individual tax return data for this analysis was extracted on 20 July 2018.

<sup>18</sup> The need for such assumptions and limitations could be avoided by keeping historical annual LTO and TIN register datasets. A potential area for extension could be to check for a potential mismatch of firms in the LTO register and firms supposedly classified under the LTO following the specified criteria.

Although the URA considers the official fiscal year to run from 1 July until 30 June, firms can apply to file their tax return filing over alternative fiscal years and can switch between fiscal year definitions. For this analysis, alternative fiscal years which end before the end of June are considered part of the fiscal year ending on 30 June.<sup>19</sup>

Corporate income tax payments in a specific fiscal year can be linked to a taxpayer but cannot be identified as tax payments for a particular fiscal year. This means that tax payments in a fiscal year could be for the current year or could be late payments for any previous fiscal year, or they could constitute interest or penalties or even prepayments for a future year. This creates challenges in estimating a yearly effective tax rate. However, we assume that late, early, and on-time tax payments, as well as interest and penalty payments, balance out over the eight fiscal years included in this analysis. In addition, it is assumed that the average effective tax rate over the period gives a good indication of the actual effective tax rates.

We distinguish between two groups of large taxpayers—domestic and multinational. To classify a large taxpayer firm as an MNC, we followed a three-stage approach. First, firms were classified as a MNC affiliate with a holding company abroad based on the response to the question about the foreign holding company in the non-individual tax filing. As not all firms responded to this question, in a second stage, we used the Orbis database as an additional source of information. Firms that reported having foreign subsidiaries in Uganda or Ugandan firms with foreign shareholders or foreign subsidiaries in the Orbis database were identified as MNCs. This information was merged with the LTO register firms based on taxpayer name. However, the Orbis database is neither representative nor complete. Therefore, in a third stage we cross-checked the remaining list of companies for obvious MNC affiliates and undertook a subsequent online search.

Finally, the information on the parent country's location is available only for MNCs matched with the Orbis database. Therefore, we performed another search for the country of the global ultimate owner of the manually classified MNC affiliates and affiliates classified by the register question. The search for the country of the global ultimate owner was conducted using the Orbis database and complemented by an online search. In a few cases, the multi-stage identification led to contradictory results. In cases where the information from the TIN register claimed that the firm had a foreign holding company but Orbis identified the firm in Uganda to be the global ultimate owner of a MNC, we were led by the TIN register information. The global ultimate owners and headquarter countries<sup>20</sup> of all MNCs were subsequently classified by continent.

Information on MNC affiliates' global ultimate owners or headquarter countries enables a distinction to be made between MNCs with a global owner in a tax haven and MNCs with a global owner in a country not considered as a tax haven. We define the tax haven status of the global ultimate owner country following Gravelle (2015), and we use the information on the global ultimate owner country to calculate the statutory tax rate differentials between these countries' and

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<sup>19</sup> The tax payments and returns of firms adhering, for instance, to a fiscal year from 2 July 2012 until 1 July 2013 therefore fall into the URA fiscal year 2013/14, whereas a firm with a different fiscal year running from 1 June 2012 until 31 May 2013 would still fall into fiscal year 2012/13.

<sup>20</sup> For firms for which information on the MNC status and country of the owner was collected manually, in some cases, information on the MNC headquarter firm and location was used if information about the global ultimate owner was not accessible.

Uganda’s 30 per cent corporate income tax rate. For this purpose, statutory corporate income tax rate information is collected from KPMG (2019).<sup>21</sup>

### 3.2 Descriptive statistics

Around 27 per cent of Uganda’s large corporate taxpayers are MNC affiliates, as shown in Table 1. There are, on average, 130–180 MNCs observed for each fiscal year.<sup>22</sup> More than a third of MNCs operating in Uganda have their global ultimate owner in Africa.<sup>23</sup> The most common countries of global ultimate ownership are Kenya, the United Kingdom, and United States.<sup>24</sup>

Table 1: Total number of firms

MNC status	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Domestic	372	430	457	474	486	494	488	264
%	74%	75%	74%	74%	73%	73%	73%	66%
MNC	131	146	158	168	178	180	178	136
%	26%	25%	26%	26%	27%	27%	27%	34%
Total	503	576	615	642	664	674	666	400

Note: this table reports the number and share of domestic and multinational firms among large taxpayers. The categorization is described in Section 3.1. The last fiscal year has fewer observations as the data was extracted six months before the tax filing deadline.

Source: authors’ own estimations based on URA administrative data and Orbis data.

Figure 3 shows the ten most common sectors in which large corporations in Uganda operate. Domestic large corporations most commonly operate in the wholesale and retail trade, and the manufacturing and financial sectors, whereas MNCs commonly operate in the financial sector, wholesale and retail trade, and the construction sector. The top ten industries for MNCs and domestic firms differ in relation to agriculture and transportation. While agriculture is the fifth most common industry among domestic large firms, it is not in the top ten of MNCs. Transportation is not in the top ten of large domestic firms but is the seventh most common sector among MNCs.

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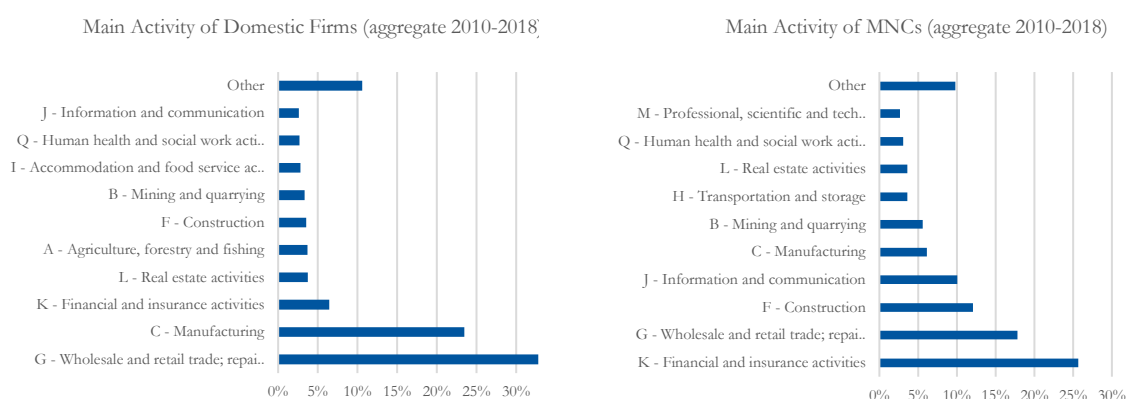
<sup>21</sup> The information on statutory tax rates has been supplemented with information from EY (2010, 2011, 2012, 2013) and Deloitte (2018).

<sup>22</sup> The last fiscal year has fewer observations since the data extraction took place six months before the tax filing deadline.

<sup>23</sup> Appendix Figure A1 reports the global ownership of multinationals by continent.

<sup>24</sup> Appendix Table A1 reports the most common countries of global ownership.

Figure 3: Percentage of firms in the most common sectors



Note: this figure reports the most common sectors and the share of firms operating in these sectors among large domestic firms and multinational corporations.

Source: authors' own estimations based on URA administrative data.

As discussed in Section 2.1., Uganda has double tax treaties with nine countries. The aim of the treaties is to increase FDI, as they are intended to prevent the double taxation of MNCs. However, such treaties largely hinder taxing inward investment. Table 2 shows that one-third of MNCs have a global ultimate owner in a DTA country.

Table 2: MNCs with global ultimate owners located in countries with a double tax agreement

MNC DTA status	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	Total
MNC w/o DTA	66%	65%	63%	66%	67%	68%	67%	70%	67%
MNC with DTA	34%	35%	37%	34%	33%	32%	33%	30%	33%

Note: this table reports the share of MNCs with and without a DTA with the country of the global ultimate owner. Approximately one-third of MNCs operating in Uganda benefit from a DTA.

Source: authors' own estimations based on URA administrative data.

Table 3 shows the share of reported zero tax collections in the data. The shares of zero tax collections are relatively similar among MNCs and domestic large firms, with domestic firms having zero tax collection slightly more often. As mentioned in Section 3.1, tax payments in a fiscal year can be for the current year or can be late payments for any previous fiscal year, or they can constitute interest or penalties or even prepayments for a future year. Therefore, the high figures for zero tax collection do not necessarily imply that two-thirds of corporations do not pay taxes, as there may be late payments too. From the 2015/16 fiscal year, there seems to be a reduction in zero tax payments irrespective of MNC status. The further reduction in fiscal year 2017/18 is misleading as the data was extracted six months before the filing submission deadline.

Table 3: Share of firms with zero tax collection within a fiscal year by MNC status

MNC status	2010/11	2011/12	2012/13	2013/14	2014/16	2015/16	2016/17	2017/18
Domestic	67%	67%	65%	64%	61%	44%	42%	18%
MNC	58%	58%	63%	67%	63%	42%	41%	29%
Total	65%	65%	65%	65%	61%	43%	42%	22%

Note: this table reports the share of observations with zero tax collection in each fiscal year.

Source: authors' own estimations based on URA administrative data.

Tables 4 and 5 report the summary statistics for large domestic corporations and for multinational corporations in fiscal years 2010/11 to 2017/18. The monetary values are reported in millions of Ugandan Shillings (UGX). Sales refer to firms' aggregate sales, and cost of sales includes labour costs and other inputs such as material and intermediate goods. Labour costs include wages and payroll costs for employees, and fixed assets refers to the value of fixed capital. We use two different profit variables: gross profit equals sales minus costs of sales, while profit before tax (taxable profit) includes income such as fees, interest, dividends, and royalties, and costs such as financial expenses, commissions, training, donations, and administrative expenses. Thus, taxable profit is the variable used when imposing taxes and gross profit is more like aggregated mark-up minus the wage bill.

Table 4: Summary statistics of large domestic corporations, 2011/12–2017/18, in millions of UGX

	mean	sd	p50	min	max
Sales (million UGX)	51,419.00	115,027.80	23,169	-9,149	1,833,100
Cost of sales (million UGX)	41,207.79	101,696.1	16,796	-204.44	1,828,400
Labour costs (million UGX)	2,297.44	7,533.18	340.53	0	139,170
Fixed assets (million UGX)	36,886.41	170,811.6	3,686.83	0	3,698,100
Gross profit (million UGX)	10,211.28	33,766.02	2,109.34	-50,360	539,200
Profit before tax (million UGX)	2,797.84	22,303.29	141.46	-125,000	530,040
Income tax (million UGX)	1,049.62	3,656.61	127.5	0.01	49,717.18
Actual effective tax rate	26.79%	147.59	20.05		
Share reported negative gross profit	12%				
Share reported negative profit before tax	31%				
Observations	3,465				

Note: this table reports the summary statistics of some key variables of large domestic corporations. Sales include all sales, and cost of sales consists of input usage such as materials, intermediate goods, and labour costs. Labour costs include wages and other employment-related costs such as bonuses and retirement fund contributions. Fixed assets describe fixed capital including machinery, land, and buildings. Gross profit equals sales minus costs of sales, while profit before tax (taxable profit) includes additional income such as fees, interest, dividends, and royalties, and costs such as financial expenses, commissions, training, donations, and administrative expenses. Income tax refers to paid corporate income tax. The actual effective tax rate is estimated as described in Section 4.1. The last two variables report the share of large domestic corporations that reported negative gross profit or profit before tax.

Source: authors' own estimations based on URA administrative data.

Table 5: Summary statistics of multinational corporations, 2011/12–2017/18, in millions of UGX

	mean	sd	p50	min	max
Sales (million UGX)	102,364.58	223,982.66	27,664.5	0	1,437,200
Cost of sales (million UGX)	46,390.15	115,120.5	8,182.26	0	1,082,200
Labour costs (million UGX)	5,881.57	12,657.52	1,897.50	0	141,490
Fixed assets (million UGX)	61,947.21	191,484.7	7,457.60	-2.30	2,250,300
Gross profit (million UGX)	32,055.18	105,702.1	7,240.19	-23,670	1,437,200
Profit before tax (million UGX)	5,364.89			-265,900	400,380
Income tax (million UGX)	3,676.78	11,552.65	498.98	0.02	115,016
Actual effective tax rate	5.86%	381.14	17.36		
Parent in tax haven (0/1)	9.02%				
Share reported negative gross profit	24%				
Share reported negative profit before tax	37%				
Observations	1,275				

Note: this table reports the summary statistics of some key variables of multinational corporations. Sales include all sales, and cost of sales consists of input usage such as materials, intermediate goods, and labour costs. Labour costs include wages and other employment-related costs such as bonuses and retirement fund contributions. Fixed assets describe fixed capital including machinery, land, and buildings. Gross profit equals sales minus costs of sales, while profit before tax (taxable profit) includes income such as fees, interest, dividends, and royalties, and costs such as financial expenses, commissions, training, donations, and administrative expenses. Income tax refers to paid corporate income tax. The actual effective tax rate is estimated as described in Section 4.1. The last two variables report the share of multinational corporations which reported negative gross profit or profit before tax.

Source: authors' own estimations based on URA administrative data.

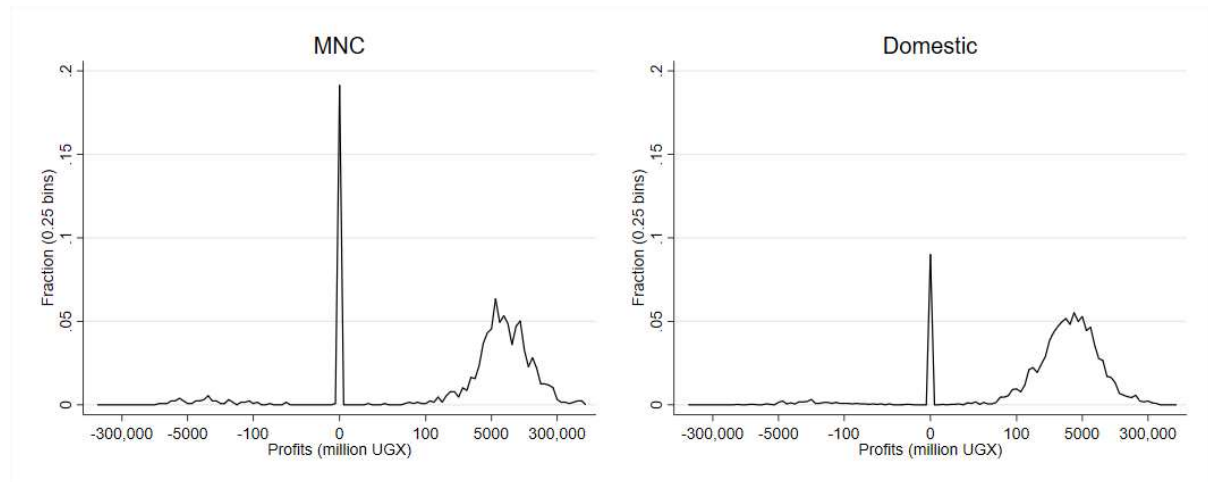
On average, MNCs have larger sales, cost of sales, total fixed assets, and labour costs. They also report higher taxable profits than domestic firms. However, the tables show a large difference in the effective tax rates on profits between domestic firms and MNCs. While, for domestic firms, the approximated average effective tax rate of 26.8 per cent is close to the 30 per cent statutory corporate tax rate in Uganda, the mean actual effective tax rate for MNCs is 5.9 per cent and is much lower than the statutory rate. The estimation of the actual effective tax rate in the tables is introduced in the next section (equation 1). High deviations in the effective tax rate can arise from the fact that tax payments cannot be identified for a single tax year, as explained in Section 3.1. The difference in the effective tax rates in these summary statistics tables already suggests that MNCs benefit from different tax incentives and may benefit from different means of tax avoidance in comparison to large domestic firms. We explain in Section 5 how these variables are used to capture profit shifting.

Figures 4 and 5 show the distribution of the declared profits of MNCs and large domestic firms on an inverse hyperbolic sine (IHS) scale. A typical challenge when studying variables with negative values is how to contract the distribution without losing zero and negative observations, as when using logarithmic transformation. Profits can typically be negative, which is a relevant feature in a study focusing on tax avoidance, so we want to keep such observations in the data. Therefore, we use an IHS instead of a logarithmic transformation.<sup>25</sup> This transformation keeps negative observations on board while contracting the distribution in a similar manner as logarithmic transformation. Figure A2 in the Appendix provides an alternative way to plot the distribution by relating profit to fixed capital. However, due to fewer observations in fixed capital, we prefer to use the IHS transformation in our main analysis.

<sup>25</sup> The IHS transformation equation is formulated in Appendix Section A.2.

Figure 4 plots the distribution of gross profits for MNCs in Uganda as well as for large domestic firms. The figures imply that almost 20 per cent of MNCs report almost exactly zero gross profits, whereas the share is close to 10 per cent for domestic firms. Gross profit equals sales minus costs of sales including labour costs and other inputs such as material, intermediate goods. Therefore, transfer pricing as a means of tax avoidance will show up in gross profit, as MNCs may affect the prices of intermediate products acquired within the same group. However, other major tax avoidance means are not likely to show up at this stage except for transfer pricing and tax evasion. These numbers seem high. The figure shows that multinationals are twice as likely as other large corporations to report zero gross profit in Uganda.

Figure 4: Distribution of gross profits of multinational corporations and large domestic firms

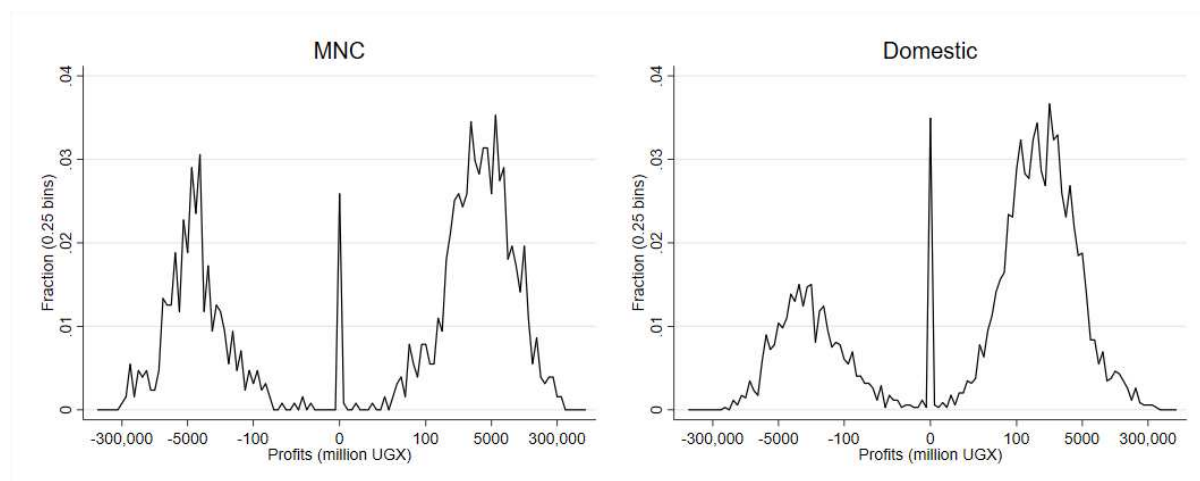


Note: these graphs plot the distributions of gross profits of MNCs and of domestic firms on an IHS transformed exponential scale.

Source: authors' own estimations based on URA administrative data.

Figure 5 shows the distribution of profits before tax on an IHS scale. This is now the profit variable used when imposing taxes, so the profit shifting incentives should materialize at this variable. Now approximately 2.5 per cent of MNCs and 3.5 per cent of large domestic firms report zero taxable profits. These are clearly lower number than the corresponding for gross profit. The key difference between reported gross profit and taxable profit is that taxable profit includes income such as interest, dividends, royalties, etc. and costs such as financial expenses, commissions, donations, administrative expenses etc. These so-called operating expenses are likely to incorporate other tax avoidance or even tax evasion means. However, for both MNCs and large domestic firms the bunching at exactly zero is higher for gross profit than profit before tax. This is somewhat surprising since corporations are more able to affect their taxable profit through different tax avoidance tools. One explanation could be that the costs and income incorporated to gross profit are more predictable and, therefore, easier to manipulate, but whether this is the case remains unclear. While domestic firms are a bit more likely to report precisely zero taxable profits compared to MNCs, MNCs report clearly more negative profits.

Figure 5: Distribution of profits before tax of multinational corporations and large domestic firms

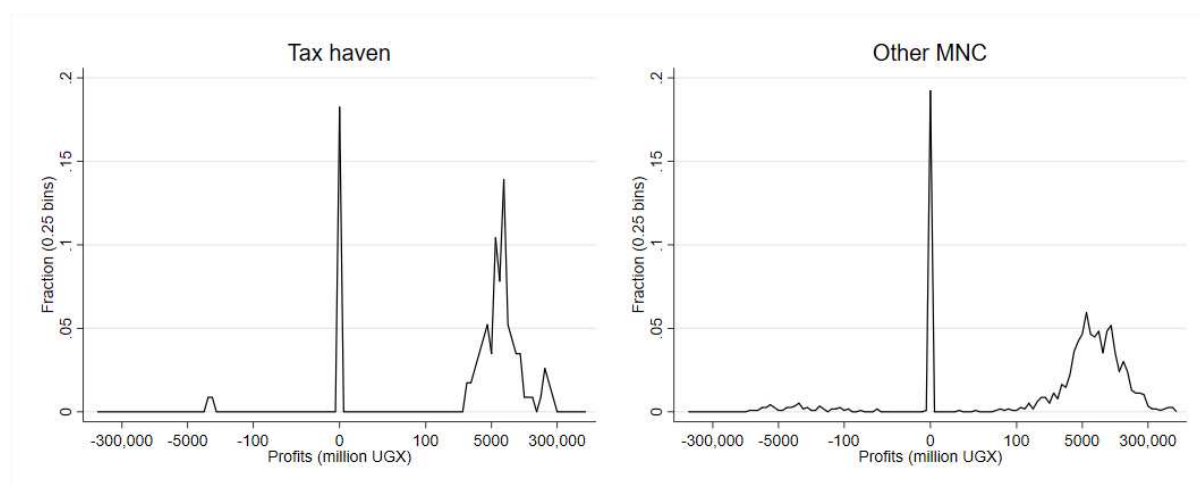


Note: these graphs show the distributions of profits before tax of MNCs and domestic firms on an IHS transformed exponential scale.

Source: authors' own estimations based on URA administrative data.

In Figures 6 and 7, we show the distribution of profits for MNCs with a global owner in a tax haven. In defining a tax haven, we follow the classification by Gravelle (2015). Figure 6 shows that there does not appear to be a notable difference in reporting gross profits between MNC affiliates with a global ultimate owner in a tax haven and other MNCs. Twenty per cent of both groups report close to zero gross profits. However, in Figure 7, we observe more than twice as high bunching at zero taxable profits for MNC affiliates with a global ultimate owner located in a tax haven compared to other MNCs. Now, more than 5 per cent of firms with a global ultimate owner in a tax haven report zero profits, while for other MNCs the share is just above 2 per cent. This could be a result of profit shifting, which tax haven firms are more likely to engage in.

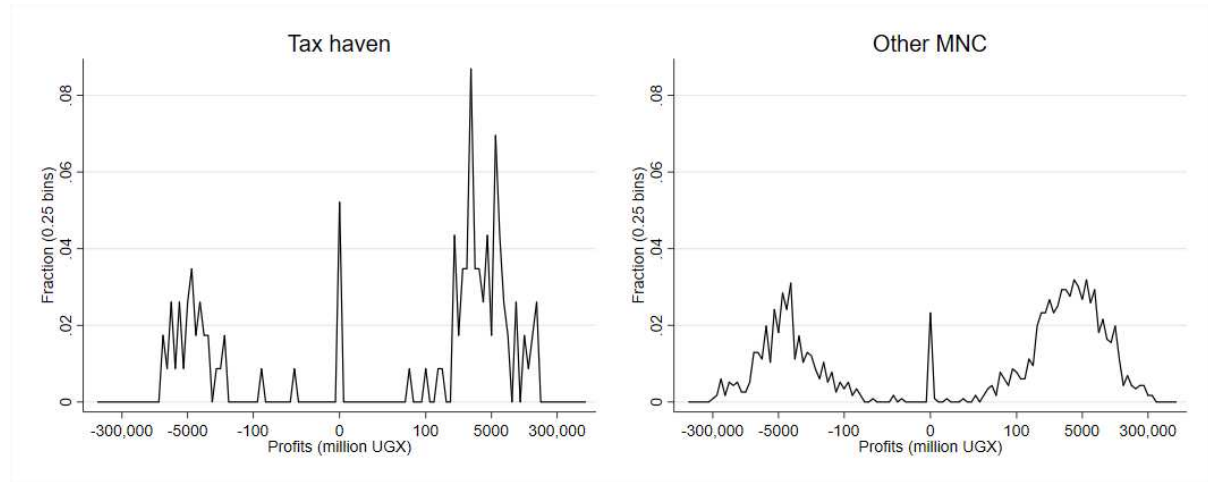
Figure 6: Distribution of gross profits of multinational corporations with a global owner in a tax haven and in other countries



Note: these graphs plot the distribution of gross profits of tax haven and other MNCs on an IHS transformed exponential scale.

Source: authors' own estimations based on URA administrative data..

Figure 7: Distribution of profits before tax of multinational corporations with a global owner in a tax haven and in other countries



Note: these graphs plot the distributions of profits before tax of tax haven and other MNCs on an IHS transformed exponential scale.

Source: authors' own estimations based on URA administrative data.

In the following sections, we study how these associations hold when taking account of different corporate characteristics, such as fixed capital and labour costs.

## 4 Methodology

### 4.1 Effective tax rate analysis

Using the actual tax payment data, we estimate average actual effective tax rates for each firm by averaging over all fiscal years as written formally in equation (1):<sup>26</sup>

$$\text{average actual effective tax rate}_i = \overline{\text{actual effective tax rate}_{it}} = \frac{\text{Collected tax payment}_{it}}{\text{Profit before tax}_{it}} \quad (1)$$

The subscripts  $i$  and  $t$  in equation (1) stand for firm  $i$  in fiscal year  $t$ . To analyse which factors drive the actual effective tax rate, we estimate the correlation between the actual effective tax rate and the MNC status and some other control variables as formalized in equation (2).

$$\text{actual effective tax rate}_i = \beta_0 + \beta_1 D_{MNC_i} + \alpha_{it} + \varepsilon_{it} \quad (2)$$

where  $\beta_0$  is a constant and  $D_{MNC_i}$  is a binary variable indicating whether firm  $i$  is an MNC, hence  $\beta_1$  is the parameter of interest. Matrix  $\alpha_{it}$  captures year and industry fixed effects and  $\varepsilon_{it}$  represents an error term. In addition, we study how having a global ultimate owner in a country with a DTA is associated with the effective tax rate. For this purpose, we use a specification where we replace  $D_{MNC_i}$  with a binary variable  $D_{DTA_i}$  denoting corporations with an owner in DTA countries. If the actual effective tax rate differs significantly between groups, it indicates that exemptions or other tax benefits, for example, may be allocated differently across groups.

<sup>26</sup>To allow actual yearly effective tax rate calculations in the future, it will be necessary to be able to link payment data to fiscal years and payment type.

## 4.2 Regression for profit-shifting analysis

We study the tax avoidance behaviour of MNCs and large domestic firms using three slightly different regression approaches that complement each other.

First, we study the differences in tax avoidance between groups following the regression analysis by Wier and Reynolds (2018).<sup>27</sup> They use ordinary least squares (OLS) identification to study how profits are associated with tax haven status when controlling for inputs, capital, and labour, the industry of the firm and year. Whereas Wier and Reynolds (2018) use log profit as the dependent variable in their main specification, we use IHS of the profit variables to avoid missing zero or negative observations.<sup>28</sup> As noted in Section 3.2, a significant number of corporations in Uganda report zero or negative profits and losing these in our estimation would give us highly distorted results. Thus, we estimate the following regression:

$$\text{IHS}(\pi_{it}) = \beta_0 + \beta_1 \log(K_{it}) + \beta_2 \log(L_{it}) + \beta_3 [D_{Haven_i}] + \alpha_{it} + \varepsilon_{it} \quad (3)$$

where  $\pi_{it}$  denotes the profit of firm  $i$  in year  $t$ ,  $K_{it}$  denotes total fixed assets, and  $L_{it}$  denotes the wage bill. Matrix  $\alpha_{it}$  captures industry and year fixed effects and double tax treaties in part of the specifications.  $D_{Haven_i}$  is a binary variable to denote corporations with a global owner in a tax haven country, according to Gravelle (2015). Thus,  $\beta_3$  captures the effect of having a global ultimate owner located in a tax haven on the Ugandan affiliate's taxable profits. If the taxable profits of the MNC affiliates with a global ultimate owner in a tax haven differ from other MNCs or domestic large firms, this is likely to be due to profit shifting. If there is no extensive profit shifting, the country of the global ultimate owner should not affect the profitability of the firm, but if all MNCs avoid taxes equally, then there will be no difference between corporations located in tax havens and other MNCs.

We use a similar setting to study how MNCs differ from large domestic firms in their reported profits as well as the effect on the reported profits of having a DTA with the country of the global ultimate owner. These associations are studied by replacing the binary variable  $D_{Haven_i}$  with another binary nominator, eg.  $D_{MNC_i}$  denoting MNCs.

Second, in addition to the binary variable, we apply a determinant of MNCs profit-shifting incentives by using the statutory tax rate difference between Uganda and the country of the global owner. The lower the tax rate in the country of the global owner, the higher is the incentive for profit shifting. While we have estimated the effective tax rates of Ugandan MNCs, these cannot be used as an explanatory variable denoting profit-shifting incentives because of their endogeneity,<sup>29</sup> so we use statutory tax rate differences as a proxy for the profit-shifting incentives. The estimable regression with statutory tax rate difference is:

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<sup>27</sup> Wier and Reynolds (2018) (earlier version: Reynolds and Wier (2016)) build on a method developed by Hines and Rice (1994).

<sup>28</sup> Ravallion (2017) provides an overview of the transformation and its benefits relative to log transformation, when studying data with non-positive values.

<sup>29</sup> The endogeneity arises from simultaneity bias (selection) as reported profit affects the effective tax rate and, moreover, some tax planning behaviour is likely to show in the effective tax rates as, e.g., reported profit is chosen at a level that minimizes the effective tax rate. Our effective tax rate analysis in the next section underlines this endogeneity issue.

$$\text{IHS}(\pi_{it}) = \beta_0 + \beta_1 \log(K_{it}) + \beta_2 \log(L_{it}) + \beta_3(\tau_{Uganda} - \tau_{GUO}) + \alpha_{nt} + \varepsilon_{it}. \quad (4)$$

Thus, the lower the statutory tax rate  $\tau_{GUO}$  in the country of the global ultimate owner in comparison to  $\tau_{Uganda}$  (30 per cent), the higher are the incentives for profit shifting. If MNCs with such incentives report lower profits, this would be captured by parameter  $\beta_3$ .

Finally, we follow Johannesen et al. (2019) in identifying aggressive profit shifting using a binary zero profit variable. Using a standard OLS regression framework, we study how the propensity to report zero profits correlates with the incentive to shift profits. If engaging in profit shifting includes a fixed cost component, it is likely that for many MNCs the optimal strategy is to either report truthfully or shift all profits. The benefit of this approach is the modest data requirement, which allows for high heterogeneity across firms. For estimation we use the following regression:

$$[\text{zero}_{it}] = \beta_0 + \beta_1 \log(K_{it}) + \beta_2 \log(L_{it}) + \beta_3 [D_{Haven_i}] + \alpha_{nt} + \varepsilon_{it}, \quad (5)$$

where  $[\text{zero}_{it}]$  is a binary variable denoting firms that reported zero profits. In the analysis we assign profits between UGX-10 million and UGX10 million, which is approximately €-2,300 to €2,300 as zero profit. We study how zero profits are associated with other corporate characteristics by replacing the binary variable  $[D_{Haven_i}]$  with a variable denoting: i) being a MNC, ii) having a DTA, or iii) the tax difference between Uganda and the country of the global ultimate owner.

## 5 Results

### 5.1 Do multinational corporations have lower effective tax rates?

In the correlation analysis reported in Table 6, we regress the effective tax rate on the MNC status. Columns 1–5 show a negative relationship between MNCs and the effective tax rate, meaning that the effective tax rate is approximately 20 percentage points lower for MNC affiliates than for domestic firms. The result is consistent when controlling for a year fixed effect, tax haven status, and industry fixed effect.

The lower effective tax rates suggest that MNCs may benefit disproportionately from selective tax incentives. One of the key issues driving the differential tax treatment seems to be the DTAs. Column 5 shows that MNCs with a global ultimate owner in a tax treaty country pay significantly lower effective tax rates than other large corporations. The relationship indicates that double tax treaties are a key driver for the difference in the effective tax rate, but we cannot rule out other exemptions or tax credits particularly benefitting MNCs. Nonetheless, this analysis only applies to firms reporting profits and excludes corporations reporting losses or zero profits. Such profits may also be manipulated and merely a symptom of tax avoidance.

Table 6: Effective tax rate correlations

	(1)	(2)	(3)	(4)	(5)
VARIABLES	eff. tax rate	eff. tax rate	eff. tax rate	eff. tax rate	eff. tax rate
MNC	-0.209*	-0.206*	-0.221*	-0.177	
	(0.114)	(0.115)	(0.119)	(0.125)	
Industry control				X	
Year control		X	X	X	X

Global owner in tax haven			0.151 (0.325)		
DTA country					-0.455*** (0.172)
Constant	0.268*** (0.0602)	0.291 (0.184)	0.291 (0.184)	0.370 (2.377)	0.277 (0.181)
Observations	2,133	2,133	2,133	2,133	2,133
R-squared	0.002	0.003	0.004	0.015	0.005

Note: standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . This table reports the regression results following equation (2) with different specifications. Column 1 reports the baseline results, column 2 reports results with a year control, and column 3 with year and tax haven status controls. Column 4 controls for year and industry and the final column for year and DTA status. The regression results indicate that MNCs with a global owner in a DTA country have a lower effective tax rate than large domestic firms.

Source: authors' own estimations based on URA administrative data.

## 5.2 Profit shifting and other tax avoidance

Tables 7–10 examine the profit-reporting behaviour of MNCs and other large corporations, using regression analysis. Table 7 presents results for equation (3) on how being an MNC (columns 1–2), benefitting from a DTA (columns 3–4), and having a global ultimate owner in a tax haven (columns 5–6) is associated with reported profits. In this table, we use both gross profit and profit before tax as dependent variables. Gross profit includes transfer pricing, but other tax planning measures are not captured in this variable, whereas taxable profit as the value used to calculate the corporate tax includes all other means such as deductions and financial arrangements.

The first row in columns 1 and 2 shows that MNCs report significantly higher gross profits and profit before tax in Uganda than large domestic corporations, when controlling for year, industry, fixed assets, and labour costs. In the previous section, we showed that MNCs face significantly lower tax rates in Uganda than local domestic firms, suggesting incentives for profit shifting for those MNCs that benefit from the low taxes in Uganda. The evidence suggests that MNCs and domestic firms use very different means of tax avoidance: While domestic firms report less profits altogether, MNCs can take advantage of different tax treaties to reduce their effective tax rates.

In the remaining columns, we focus solely on MNCs. Column 4 reports that firms with a global ultimate owner in a DTA country report almost three times higher taxable profits before tax in Uganda than other MNCs. The effect only shows in the profit before tax but not in gross profit. This suggests that the difference between the two groups arises completely from other operating costs rather than sales and inputs. Finally, columns 5 and 6 report the regression results for tax haven firms versus other firms. The differences between the two groups are statistically insignificant. The result is very different to the result in Wier and Reynolds (2018), who find that MNCs owned in tax havens report 50 per cent lower profits in South Africa compared to other MNCs. While in Wier and Reynolds (2018), the strong result is driven by a few firms, in Uganda, a large number of MNCs have a very low tax burden, reducing the difference between tax haven corporations and other MNCs.<sup>30</sup>

<sup>30</sup> The histograms in Figure A3 in the Appendix show that MNCs have close to zero effective tax rates in Uganda more often than domestic firms.

Table 7: Regression output—profit of MNCs with global owner in a tax haven and in a DTA country

Dependent variable	MNC vs large domestic		DTA vs other MNC		Tax haven vs other MNC	
	(1)	(2)	(3)	(4)	(5)	(6)
	Gross profit (IHS)	Profit before tax (IHS)	Gross profit (IHS)	Profit before tax (IHS)	Gross profit (IHS)	Profit before tax (IHS)
MNC	0.729*** (0.168)	1.508*** (0.320)				
DTA			0.389 (0.282)	1.898** (0.599)		
Tax haven					-0.324 (0.378)	1.303 (0.866)
Log fixed assets	0.153*** (0.0359)	-0.269*** (0.0640)	0.337*** (0.0935)	-0.0948 (0.163)	0.346*** (0.0942)	-0.101 (0.161)
Log labour costs	0.856*** (0.0506)	0.859*** (0.0842)	1.022*** (0.155)	0.910*** (0.230)	1.018*** (0.156)	0.989*** (0.227)
Industry FE	X	X	X	X	X	X
Year FE	X	X	X	X	X	X
Constant	1.385*** (0.362)	-14.86*** (0.852)	-1.933 (1.082)	-17.09*** (1.914)	-1.992 (1.067)	-17.77*** (1.927)
N	4,101	4,101	1,047	1,047	1,047	1,047

Note: robust standard errors in parentheses. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ . This table reports regression results for equation (3) on how being an MNC (columns 1–2), benefitting from a DTA (columns 3–4), and having a global owner in a tax haven (columns 5–6) is associated with reported profits. All specifications include year and industry fixed effects as well as a control for fixed capital and labour costs.

Source: authors' own estimations based on URA administrative data.

Table 8 reports the regression results for equation (4) on how the statutory tax difference between Uganda and the country of the global ultimate owner is associated with reported profits. The parameter of interest in the first row indicates that the lower the statutory tax rate in the global ultimate owner's country in comparison to Uganda, the lower is the reported profit in Uganda. Columns 1 and 2 report results for gross profit and profit before tax, controlling for fixed assets, labour costs, year, and industry. In columns 3 and 4, an additional control for the double tax treaty is added. The parameter in columns 2 and 4 implies that a 1 percentage point lower statutory tax rate in the country of the global ultimate owner is associated with a 1.6 to 3.6 per cent lower taxable profit in Uganda, on average, the stronger effect applying when controlling for the existence of a DTA. While the signs of the estimates suggest that lower taxes in the global ultimate owner's country are associated with lower reported profits in Uganda, the estimates are not statistically significant. This may be due to the limited sample size.

Table 8: Regression output—reported profit and statutory tax difference between global owner and Uganda

	(1)	(2)	(3)	(4)
Dependent variable	Gross profit (IHS)	Profit before tax (IHS)	Gross profit (IHS)	Profit before tax (IHS)
Tax difference	-0.996 (1.251)	-1.627 (3.080)	-1.446 (1.284)	-3.643 (3.163)
DTA country			0.377 (0.289)	1.687** (0.626)
Log fixed assets	0.353*** (0.0950)	-0.0206 (0.163)	0.349*** (0.0951)	-0.0364 (0.163)
Log labour costs	1.108*** (0.157)	0.933*** (0.231)	1.099*** (0.158)	0.893*** (0.232)
Industry FE	X	X	X	X
Year FE	X	X	X	X
Constant	-2.664** (1.018)	-17.65*** (1.967)	-2.523* (1.047)	-17.02*** (1.967)
N	1,011	1,011	1,011	1,011

Note: robust standard errors in parentheses. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ . This table reports the regression results of how the difference in statutory tax rates between Uganda and the parent country is associated with the reported profit in Uganda, following equation (4). Column 1 estimates the results for gross profit and column 2 for profit before tax when controlling for fixed assets, labour costs, and industry and year fixed effects. Columns 3 and 4 additionally control for DTA status. All the different specifications point in the direction that the lower the tax rate in the country of the global owner, the lower is the reported profit in Uganda.

Source: authors' own estimations based on URA administrative data.

Tables 9 and 10 show how reporting zero or non-positive taxable profits is associated with different corporate characteristics, following equation (5). First, we look at the reporting of exactly zero profits in Table 9. Column 1 in Table 9 suggests that when controlling for fixed assets, labour costs, industry, and year, there is no difference between MNCs and large domestic firms in reporting zero profits. According to column 2 there is also no difference between tax havens and other MNCs operating in Uganda. Columns 3 and 4 show that the tax difference between Uganda and the global ultimate owner country is also not associated with reporting zero profits. However, there are fewer corporations altogether that match exactly zero taxable profits. According to visual evidence in Section 3.2, it seems easier for corporations to match zero in reported gross profits while reporting negative taxable profits. Thus, in Table 10 we study how these corporate characteristics are associated with reporting zero taxable profits or losses in Uganda. Column 1 suggests that when controlling for fixed assets, labour costs, industry, and year, MNCs are 10 per cent more likely to report losses in Uganda compared to large domestic firms. Column 2 indicates that having a tax haven connection through the global ultimate owner is not associated with reporting zero profits. Finally, columns 3 and 4 give suggestive evidence that the lower the tax rate in the country of the global ultimate owner in comparison to Uganda, the more likely the MNC is to report negative profits in Uganda. Again, this connection is not statistically significant, given the small number of observations, but the association is quite large.

Table 9: Regression output—reporting zero profit before tax among Ugandan multinationals

	(1)	(2)	(3)	(4)
Dependent variable	Zero profit (binary var)	Zero profit (binary var)	Zero profit (binary var)	Zero profit (binary var)
MNC	0.00393 (0.00393)			
Tax haven		0.00056 (0.01208)		
Tax difference			-0.0290 (0.0533)	-0.0405 (0.0544)
DTA country				0.00980 (0.00814)
Log fixed assets	-0.00805*** (0.00180)	-0.00837** (0.00303)	-0.00867** (0.00317)	-0.00879** (0.00320)
Log labour costs	-0.00389* (0.00189)	0.00592 (0.00321)	0.00581 (0.00337)	0.00559 (0.00331)
Industry FE	X	X	X	X
Year FE	X	X	X	X
Constant	0.139*** (0.0222)	0.0353 (0.0191)	0.0424 (0.0240)	0.0458 (0.0246)
N	4,101	1,047	985	985

Note: robust standard errors in parentheses. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ . This table reports the regression results for how different corporate characteristics are associated with reporting zero profits, following equation (5). Column 1 suggests that when controlling for fixed assets, labour costs, industry and year, there is no difference between MNCs and large domestic firms in reporting zero profits and column 2 that there is also no difference between tax havens and other MNCs operating in Uganda. Columns 3 and 4 show that the tax difference between Uganda and the global ultimate owner country is also not associated with reporting zero profits.

Source: authors' own estimations based on URA administrative data.

Table 10: Regression output—reporting no profit before tax among Ugandan multinationals

Dependent variable	(1) No profit (binary var)	(2) No profit (binary var)	(3) No profit (binary var)	(4) No profit (binary var)
MNC	0.105*** (0.0188)			
Tax haven		-0.06402 (0.05089)		
Tax difference			0.243 (0.179)	0.292 (0.186)
DTA country				-0.0415 (0.0356)
Log fixed assets	0.0299*** (0.00414)	0.01471 (0.0092)	0.00830 (0.00939)	0.00884 (0.00943)
Log labour costs	-0.0406*** (0.00550)	-0.04551*** (0.01298)	-0.0422** (0.0132)	-0.0413** (0.0132)
Industry FE	X	X	X	X
Year FE	X	X	X	X
Constant	0.963*** (0.0495)	1.2470*** (0.1082)	1.222*** (0.112)	1.207*** (0.113)
N	4,101	1,047	985	985

Note: robust standard errors in parentheses. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ . This table reports the regression results for how different corporate characteristics are associated with reporting zero profits, following equation (5). Column 1 shows that when controlling for fixed assets, labour costs, industry, and year, MNCs are 10% more likely to report losses in Uganda than large domestic firms. Column 2 indicates that tax haven status is not associated with reporting zero profits. Finally, columns 3 and 4 suggest that the lower the tax rate in the country of the global ultimate owner in comparison to Uganda, the more likely the MNC is to report negative profits in Uganda.

Source: authors' own estimations based on URA administrative data.

## 6 Conclusion

We studied tax avoidance of MNCs in Uganda using administrative data on large corporations. The heterogeneity in taxes paid by large MNC affiliates versus large domestic firms suggests that MNC affiliates located in Uganda benefit from two tax avoidance channels. First, our results suggest that MNC affiliates, especially those with global ultimate owners located in countries with which Uganda has a DTA, have an approximately five times lower effective tax rate than large domestic firms. Second, our analysis indicates that MNC affiliates may exploit profit shifting opportunities to reduce their tax liabilities in Uganda. MNCs are more likely than domestic firms to report losses when controlling for several corporate characteristics such as fixed capital, industry, and labour costs. Moreover, the reported taxable profit seems to be negatively associated with a lower statutory tax rate in the country of the global ultimate owner of the MNC.

Over the last decade, the Ugandan government and the URA have been revising existing and developing new tax policies and practices by, for example, renewing the transfer pricing regulations in 2011 and the thin capitalization rules in 2018. However, DTAs, tax holidays, and insufficient tax enforcement still limit Uganda's and the URA's ability to increase domestic revenue collection. The findings presented in this study highlight the need to further pursue the renegotiation of

double tax treaties and re-evaluate the return on investment and revenue forgone through the granting of tax exemptions, tax holidays, and other tax incentives.

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## Appendix

### A.1 Acronyms

DTA	–	Double tax agreement
FDI		Foreign direct investment
HIS	–	Inverse hyperbolic sine transformation
LTO	–	Large taxpayer office
MNC	–	Multinational corporation
TIN		Tax Identification Number
URA	–	Uganda Revenue Authority

### A.2 IHS transformation

The inverse hyperbolic sine transformation (IHS) is formally expressed as

$$IHS(x) = \log(\sqrt{x^2 + 1} + x) \quad (A1)$$

### A.3 Additional tables and descriptive figures

Table A1 reports the ten most common countries of the global ultimate owner of Ugandan MNCs and Figure A1 reports how different continents are represented among MNCs' global ultimate owners. The majority of MNCs have their owner in Africa or Europe.

Figure A2 plots the distribution of reported profits before tax relative to fixed capital for MNCs and large domestic firms over the period from 2011 to 2018. The figure shows a clear concentration of observations at zero for both firm groups. The histograms in Figure A3 show that MNCs have a close to zero effective tax rate in Uganda more often than domestic firms.

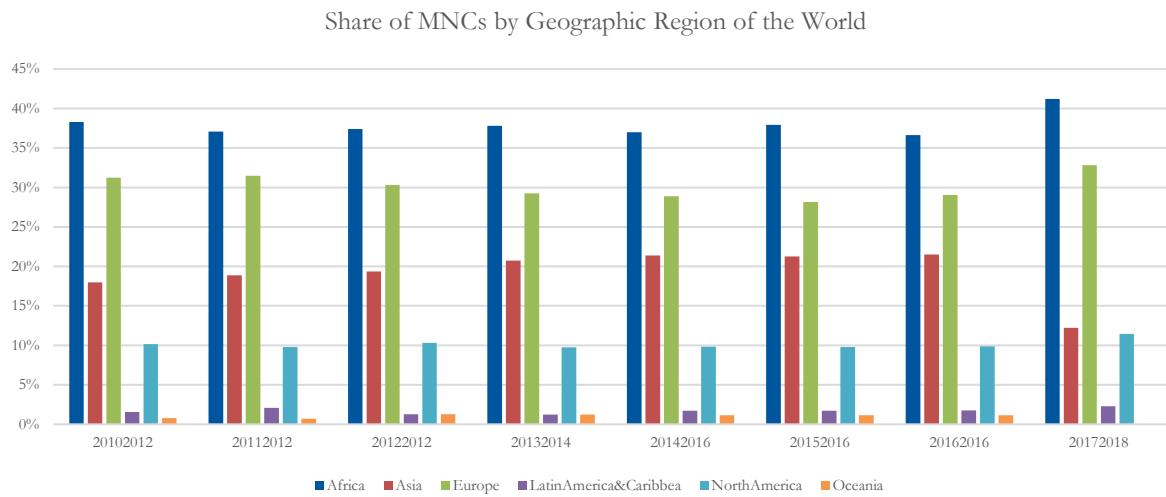
Table A1: Ten most common global ultimate owner countries

	N of MNCs.
Kenya	31
United Kingdom	20
United States	16
South Africa	14
China	14
India	11
Switzerland	5
Netherlands	5
Germany	5
Mauritius	5

Note: this table lists the most common countries of the global ultimate owners of MNCs over the period 2011–18.

Source: authors' own estimations based on URA administrative data

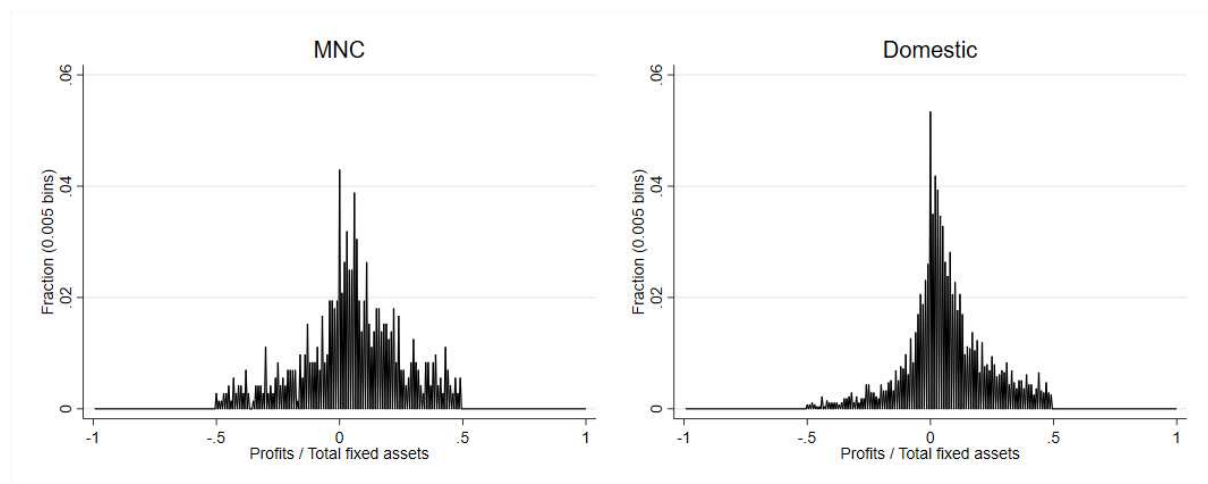
Figure A1: Share of MNCs by geographic region of the world



Note: this figure plots the share of MNCs by geographic region.

Source: authors' own estimations based on URA administrative data.

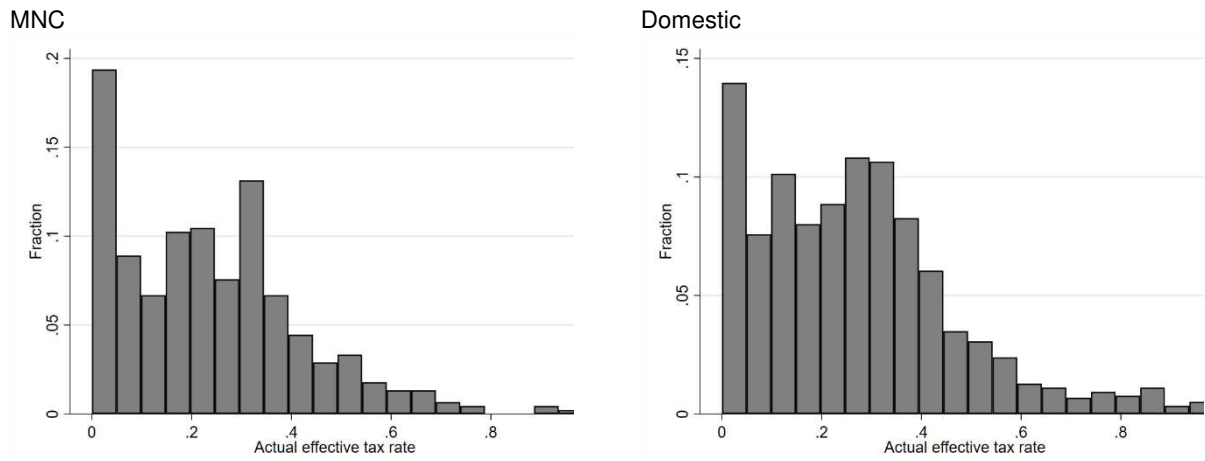
Figure A2: Reported profit before tax relative to fixed capital



Note: these graphs plot the distribution of reported profits before tax relative to fixed capital for MNCs and large domestic firms over the period 2011–18.

Source: authors' own estimations based on URA administrative data.

Figure A3: Effective tax rates on profit—multinational and domestic corporations



Note: these graphs plot the distributions of actual effective tax rates over the period 2011–18. The horizontal axis is limited from 0 to 1, while some estimated effective tax rates are below zero or above 1.

Source: authors' own estimations based on URA administrative data.