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Effective tax rates and firm size: the case of Uganda

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Effective Tax Rates and Firm Size: The Case of Uganda[1]

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Abstract

Do some firms pay more corporate taxes than others? If so, which types of firms benefit from a reduced tax burden, and how do they achieve this reduction? Are differences in tax rates due to the design of the tax system, to strategic tax planning or to differential enforcement? These questions matter for tax design and are difficult to answer in an empirically founded and comprehensive manner. We use administrative tax data in many countries to systematically calculate firm-level effective tax rates (ETRs) and study how ETRs vary across the firm size distribution. This note shows the results for Uganda, where the corporate statutory tax rate is 30%. We find that the ETR averages 14% across all firms, increases slightly over the firm-size distribution, and drops at the top for the largest firms.

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1 Introduction

The effective tax rate (ETR) summarizes the tax burden faced by firms. Two effective tax rate concepts exist for corporate taxes: forward-looking ETRs, which measure the tax burden of a hypothetical investment project over its lifetime, and backward-looking ETRs, which are based on taxes paid on realized sales and profits. Our study focuses on backward looking ETRs built ex-post from micro tax return data. Depending on the exact ETR definition (more details below), it captures a combination of the effect of statutory tax provisions (e.g. statutory tax rates and tax base definitions), differences in enforcement (e.g. size-dependent enforcement Basri et al. 2019), and firms' responses to the tax system (e.g. tax planning via deductions and exemptions Siegfried 1974, Tørsløv et al. 2020). While the statutory corporate tax rate is often the same for all firms, the ETR can still vary substantially across firms due to these other elements.

Differences in ETRs across firms could matter for efficiency and for equity. From an efficiency perspective, differences in tax rates across firms lead to a misallocation of resources lowering productivity (Diamond and Mirrlees 1971, Bachas et al. 2019). From an equity perspective, smaller firms are often owned by poorer entrepreneurs than larger firms (La Porta and Shleifer, 2014), and employ poorer/more informal workers (Ulyssea, 2018). Further, there is evidence that taxes on firms pass through to employees' wages (Arulampalam et al. 2012, Suárez Serrato and Zidar 2016, Fuest et al. 2018). Thus, if smaller firms bear a disproportionate tax liability, then taxes could exacerbate inequality.

A handful of studies examine the relationship between ETRs and firm size, but these studies differ in their methodologies and results. The studies differ in the data they use—financial statements, administrative tax data or survey data—and the definition of the ETR.[2] Results are thus hard to compare, and unsurprisingly the literature has not produced consistent evidence on the ETR-firm-size relation.

We use firm-level administrative tax returns and a transparent methodology which can be applied across countries, to estimate the ETR and describe the ETR-firm-size relation. We also correlate the ETR with firm characteristics such as sector of activity, location, ownership status and firm age. Administrative tax records are an attractive data source to construct ETRs since they cover all formal firms in a country, and contain precise information on firms' tax liability.[3] In contrast, financial statements, which

[2]For example in Uganda, Gauthier and Reinikka (2006) argue that most of the tax burden is borne by mid-size firms, whereas large firms benefit from tax exemptions and smaller firms evade taxes. Other studies find that the ETR increases with firm size (Zimmerman 1983), decreases with firm size (Nicodème 2002, Richardson and Lanis 2007), is U-shaped ETR in firm size (Halleux and Valenduc 2007, Mascagni and Mengistu 2019), or that there is no systematic relation between ETRs and firm size (Lazăr 2016).

[3]Of course tax data are self-reported by firms and subject to evasion and underestimation. Depending on the type of misreporting, ETR estimates from tax data could be lower or upper bounds on the true ETR. If misreporting is firm-size or industry-specific, this type of measurement error could bias the analysis of the ETR-firm-size relationship.

have often been used in the past, only feature accounting measures of taxable profits, and hence represent an approximation of the true tax-relevant variables. Besides, in low and middle-income countries, financial statements are only available for very large, listed companies.

This note presents the methodology and results on the ETR and the ETR-firm-size relationship for Uganda. In comparison to other African countries, Uganda has one of the lowest share of CIT revenue as percentage of GDP (0.7 percent against 2.8 percent on average in 2018).[4] It is important to understand how corporate income are collected across the firm-size distribution. Anonymized firm-level corporate tax records for Uganda are provided by the Ugandan Revenue Authority. The data contains all corporate tax records for the years 2015-2020. It includes the main variables used to construct ETRs, and it features a breakdown of firms' costs. Information on firm characteristics such as sector and location is available for Uganda. We do not have information on ownership or firm age, but we use these data in other countries where it is available.

2 Methodology

We define a firm's effective tax rate as the corporate income tax liability divided by economic profit. While the choice of the numerator is straightforward, the choice of the denominator is debated in the literature. Our objective is to measure firms' profitability without the influence of exemptions and non-standard deductions that lower firms' taxable profits via tax planning activities. The relevant concepts are represented in Figure 3 in the appendix. Using total sales/turnover as the denominator is the simplest option, but is problematic, as any comparison implicitly assumes that all firms have the same true profitability. Using the net tax base as the denominator would mechanically yield an ETR that equals the statutory tax rate, since all exemptions lowering a firm's tax base are already accounted for. There is thus a trade-off between choosing a concept that approaches a firm's true profitability, and taking into account tax expenditures.

Economic profit (i.e. net profit) is defined as total income minus all standard deductions: material, labor, operational costs, depreciation and financial costs. The measure is related to financial-statement-based measures of ETRs, which use Earnings Before Interest and Taxes (EBIT) or Earnings Before Interest, Taxes, Depreciation, and Amortization (EBITDA) as the denominator. But unlike these financial-statement-based measures, we allow depreciation, interest and financial expenses to be deducted when calculating net profit. Studies based on tax data often use gross profit, defined as turnover minus the cost of goods sold. The cost of goods sold includes only direct inputs and production costs, but does not include wages, management and overhead. In countries where the breakdown of costs into its components is available, we compare our ETR measure based on net profit to alternative measures (see appendix figure 5). We also look at the

[4] See figure 4.

link between ETR and sector, and find no relationship (see appendix figure 6).

This ETR measure is transparent and comparable across countries. The construction of the measure does not depend on country-specific rules about exemptions and deductions. By using net profit as a denominator, we are confident that all economic costs have been deducted, but adjustments to taxable profit are yet to be made: re-integration of non deductible expenses, deductions of exempt incomes, applications of capital allowances and investment incentives exemptions, and finally carried over losses from previous periods. We can thus observe differences in effective taxation due to tax expenditures.

3 Empirical Evidence on the ETR-Firm-Size Relationship in Uganda

Ugandas statutory corporate tax rate (STR) is 30%.[5] We find that the average effective tax rate is 14.4% in 2019, for the whole sample. The gap between the rates can be mostly be explained by loss-making firms within the distribution that face a negative or zero liability for the period, and hence an ETR of zero. For profitable firms only, the average reaches 29.7%. For some firms, the ETR can be larger than the statutory rate since it is calculated before the re-integration of non-deductible costs, which artificially lowers taxable profits. The remaining small *negative* gap between ETR and STR–where the ETR is lower than the STR–can be explained by the different tax exemptions.

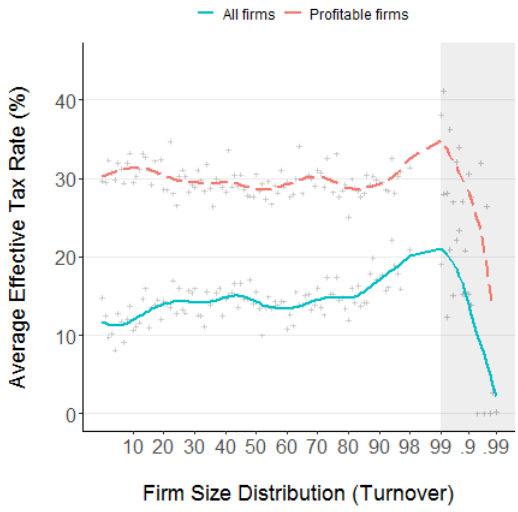
We find that the ETR slightly increases with firm-size over most of the distribution (Figure 1). Figure 1a plots the average ETR by quantiles of firm turnover, and shows that firms in the first decile face an ETR that is 6 percentage points lower that firms in the tenth decile. These differences in ETRs are mostly driven by differences by the number of loss-making firms in each quantile. When we restrict the sample to profitable firms (red lines)–around 63% of the sample–the slope flattens, suggesting that loss-making firms explain the relationship between ETR and firm-size. This is different in other countries, where the ETR retains a slope in turnover for the sub-sample of profitable firms.

Given the contribution of the largest firms to total revenue collection, we are also interested in the ETR at the very top of the firm-size distribution. Figure 1b presents the distribution in percentiles, and further decomposes the top 1% in the top 0.1 and 0.01%. While the ETR increases up to the 99th percentile, its slope decreases sharply for the top 1 percent. This pattern is present in both samples, suggesting that it is not driven by loss-making firms. This also means that the largest firms face a lower tax burden. In other countries, we also observe a general decreasing trend at the top.

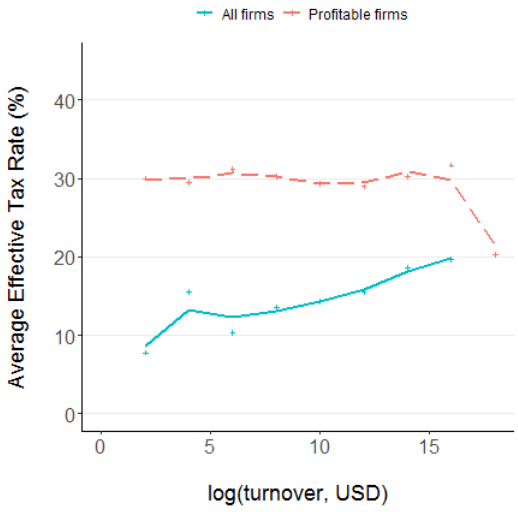
[5] There also exists specific regimes for smaller firms: resident taxpayer whose turnover is between UGX 50 million and UGX 150 million are subject to a mix of fixed amounts and rates to determine the corporate income tax. We don't include those taxpayers in this analysis.

Figure 1: **Average Effective Tax Rate**

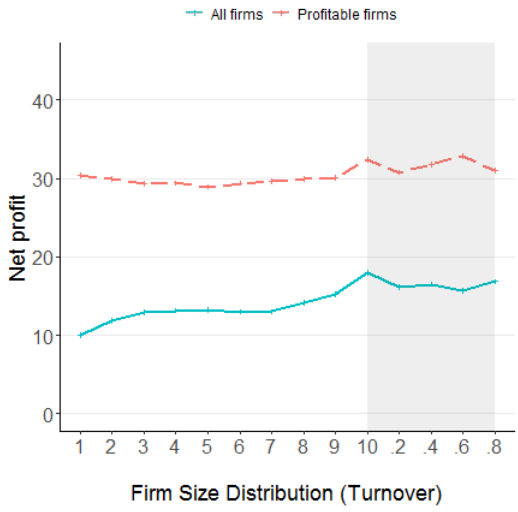
(a) By Deciles of Turnover



(b) By Percentiles of Turnover



(c) By Log Turnover



(d) By Deciles, Averages 2015-2019

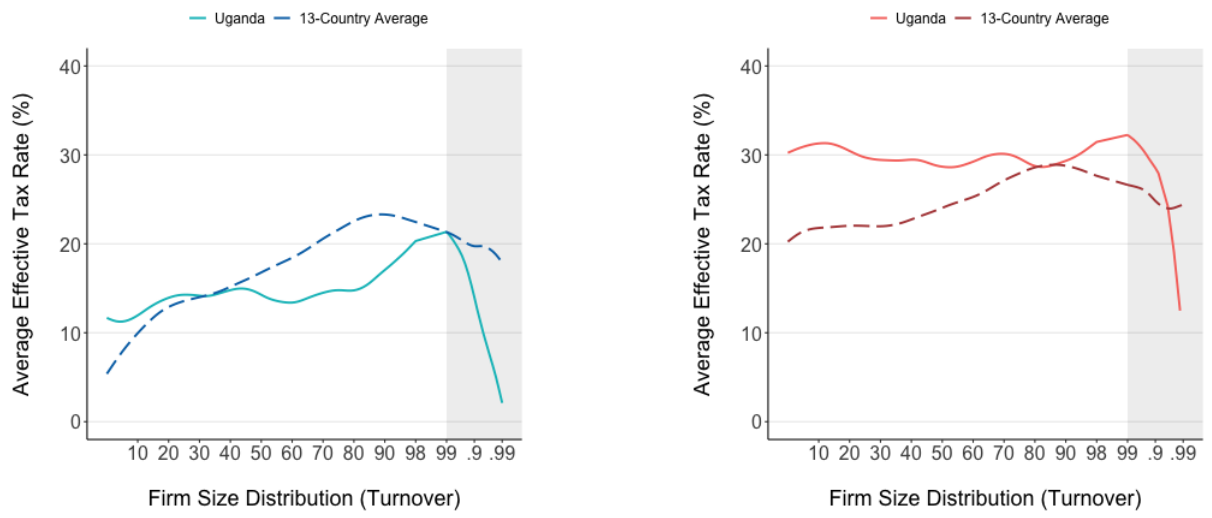
Panel (a) and (b) show the average ETR (CIT liability/Net profit) by (a) deciles and (b) percentile of turnover for the last available cross-section (2019). Decile 10 in (a) is split in 5 or in quantiles 99.9 and 99.99 in (b), and represented in the grey area. Panel (c) shows the average ETR by equally-sized bins of log turnover (in USD) for 2019. Panel (d) shows the average ETR by deciles of turnover for the last year of the panel (2015-2019). In (b), the ETR is built at the firm level as the ratio of Total CIT liability over Total profit, where the totals are the sums across the years. The blue line includes all firms and negative ETRs are set to zero. The red line includes only profitable firms.

Alternative measures of the firm-size distribution yield a similar message. Figure 1c plots the ETR

by equally-spaced intervals of log turnover and shows a very similar pattern. The ETR is roughly flat in log(turnover) for profitable firms and decreasing when we reach the top of the distribution (red line). Finally, the results are consistent when the firm's ETR is built with total liability and total net profit across years (2015-2019).

Uganda's ETR by firm size resembles that of the 13 other countries for which such data is available. Figure 2 shows the ETR distribution by percentile of turnover for Uganda vs other countries. The patterns of ETR by firm size are fairly similar between the two samples: the ETR is increasing across most of the distribution, and decreases for the largest firms (figure 2a). In Uganda, the ETR first increases up to the 30th percentile, and then continues to increase from the 80th to the 99th percentile. In the 13-country average, the increasing slope is more progressive and more sustained. Regarding the drop in ETR at the top, this concerns the very large firms within the top 1% for Uganda and it is very sharp, while it happens earlier in the average country–around the 90th percentile–and is less pronounced. When we account for loss-making firms (figure 2b), the average slope is reduced in the 13-countries average and has fully disappeared in Uganda. The results at the top remain fairly similar for the 13 countries average and for the Uganda, where the decreasing slope at the top is still very steep and account for almost 20 percentage points.

Figure 2: **International Comparison**



(a) All Firms

(b) Profitable Firms Only

Figure 2 shows the average ETR (CIT liability/Net profit) by percentile of turnover for the last year for Uganda (solid line), and for our international sample of countries (dashed line). Our sample includes 13 countries: 4 countries in Africa, 7 in Latin America and 2 in the Balkans. Panel (a) includes all firms and negative ETRs are set to zero, and Panel (b) includes only profitable firms.

4 Appendix

Figure 3: **Concepts and Variables**

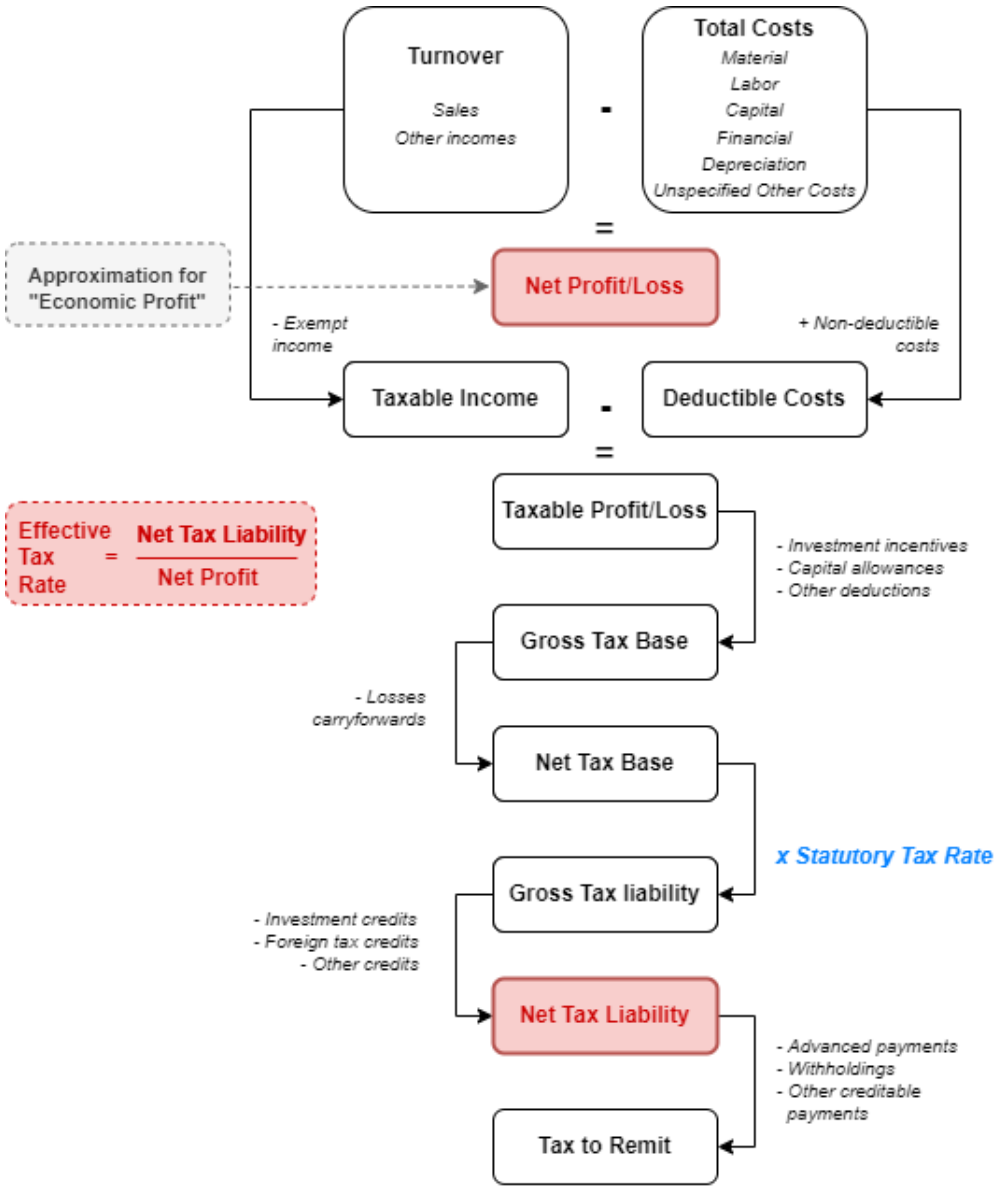
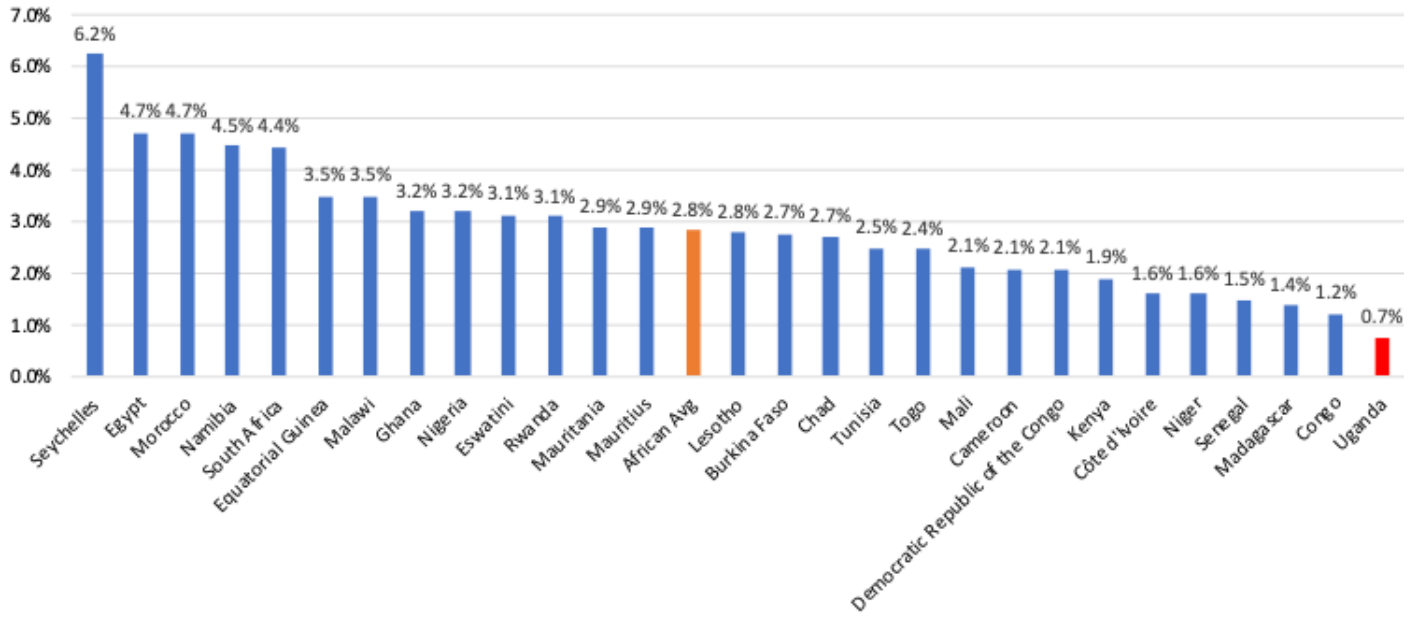
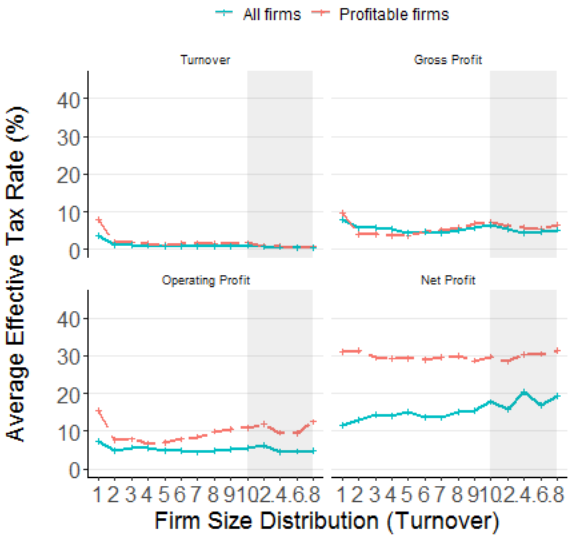


Figure 4: **CIT Revenue, as percentage of GDP (2018)**



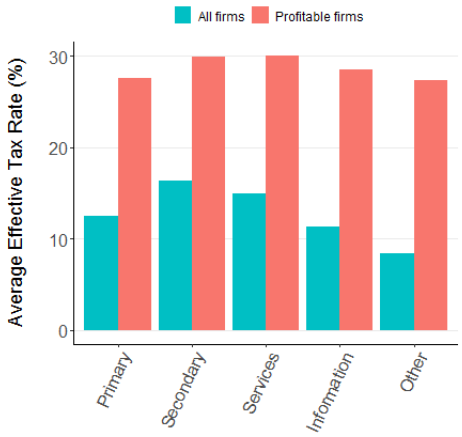
This graph shows CIT revenue as percentage of GDP for many African countries in 2018, using data from the UNU-WIDER Government Revenue Dataset.

Figure 5: **Average Effective Tax Rate with Different Profit Metrics**



These graphs show the average for different ETR measures: CIT liability divided by Turnover, Gross Profit, Operating Profit and Net Profit, for each decile of turnover for the last year of the panel (2019). Everything else is as in Figure 1.

Figure 6: **Average Effective Tax Rate By Sectors**



These graphs show the average ETR (CIT liability/Net Profit), by large categories of sectors: Primary activities (Agriculture and Mining), Secondary activities (Manufacturing, Electricity & Water supply, Construction), Services (Transport, Food and Accommodation, Health, Entertainment, Administration, Real Estate, Wholesale and Other services), Information activities (Financial activities, Information and Communication, Scientific activities and Education), and Other activities; for the last year of the panel (2019). Everything else is as in Figure 1.

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