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The regressivity of CIT exemptions in Africa

Alou Adessé Dama^{1,2}, Grégoire Rota-Graziosi^{1,2*}, and Fayçal Sawadogo^{1,2}

Abstract: Tax holidays remain essential to attract investment in Africa and, more broadly, in developing countries. However, this tax incentive must be better designed to target relevant firms or investments. Based on 2020 tax information, we compute the Effective Average Tax Rate (EATR) of a representative firm with and without investment incentives for 44 African countries. We appreciate the progressivity or regressivity of national tax systems applied to corporations by varying the tax burden with the gross firm's profitability. Under tax incentives regimes, 20 out of the 44 countries have a regressive EATR profile: They tax more, less profitable firms. We emphasize that 65 percent of these countries use Corporate Income Tax (CIT) exemption as their main tax incentive instrument. We consider an alternative tax incentive mechanism: CIT credit. This instrument appears superior in several dimensions: (1) Tax credit may reduce the tax burden as CIT exemption does; (2) However, it keeps and may even restore the progressivity of tax incentives; (3) It is less costly to manage for the tax administration. We developed a web application that allows replicating and modifying our analysis and any financial or tax parameter (<https://shiny.mesocentre.uca.fr/app/citregressivity>).

Keywords: Tax incentives; Corporate Income Tax; Transparency; Developing countries.

JEL Codes: H25; O22; O55.

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I. Introduction

Financial liberalization triggered a downward tax competition among countries (surveyed among others by Leibrecht and Hochgatterer, 2012; Devereux and Loretz, 2013; or Keen and Konrad, 2013). Tax competition may take several forms, such as the decrease in statutory tax rates, especially for Corporate Income Tax (CIT), narrower taxable base resulting from additional deductible costs as allowance for corporate equity or accelerated depreciation rules, or tax credits¹ for multiple purposes (research and development, employment, green transition, etc.). A particular tax incentive is CIT exemption (or equivalently, CIT holidays),² which is most common in developing countries. In 2012, only 21 percent of OECD countries used them, while 60 percent of Sub-Saharan African countries, 92 percent of East Asia and Pacific countries, and 100 percent of South Asian countries proposed these investment incentives (James, 2013). The Global Tax Expenditure Database (GTED) identifies 1,613 CIT exemptions in 101 countries (see Redonda et al., 2021).

A significant literature examined the effect of tax on Foreign Direct Investments (FDI) flows (see Hines, 1999 for a survey and De Mooij and Ederveen, 2003 for a meta-analysis). Djankov et al. (2010) used the effective CIT rates of a representative firm in 85 countries. They conclude that higher CIT rates reduce gross investment, FDI, and entrepreneurship. Feld and Heckermeyer (2011) confirm this strong relationship between tax and FDI in a meta-analysis of 45 studies. If tax matters for FDI, the effectiveness of tax incentives in attracting FDI appears less convincing in empirical studies. For instance, Klemm and Van Parys (2011) show that tax incentives increase FDI. However, these additional investments crowd out other investments, canceling the aggregate effects of tax incentives on investment and growth.

This paper aims to appreciate the design of tax incentive regimes captured through the Investment Code or Act in 44 African countries.³ We do not assess the effectiveness of tax incentives to attract FDI as in the previously quoted articles, but their relative progressivity or regressivity. Progressivity and regressivity are usually associated with Personal Income Tax (PIT) and/or Value Added Tax (VAT) and concern individuals or households. We consider corporations and how their effective tax burden changes with their gross profitability. Standard

¹ We consider tax credits as mechanisms that reduce the amount of taxable income (and tax due) depending on investment. For instance, a firm invests in some capital goods eligible for tax credit. This investment would generate depreciation allowances that reduce taxable profit and the right to decrease taxable profit by a percentage of the eligible investment. Tax credits are refundable in our country sample.

² We use "CIT exemption" and "CIT holidays" as synonyms. CIT exemption means no CIT payment or equivalently zero taxable income depending on the exact wording of countries' Investment Code or Act.

³ We consider all African countries for which we were able to collect online relevant information.

and incentive tax regimes are progressive (respectively regressive) if the tax burden increases (respectively decreases) in before-tax income.

CIT progressivity is not a new issue. For instance, the United States had progressive CIT rates until 2017 (see Avi-Yonah, 2022)⁴ and Morocco adopted a progressive CIT rate in 2016.⁵ More recently, excess profit tax under discussion at the European Union,⁶ the new windfall tax in the United Kingdom, the U.S. tax proposal on 'supernormal' profits, or the OECD Global Anti-Base Erosion (GloBE) rules establishing a minimum tax on multinational enterprises' profit⁷ renew the notion of profit and its taxation. All these tax reforms aim to introduce some progressivity by taxing more of the economic rent component of profit (Avi-Yonah, 2020). For instance, the OECD proposal for a global minimum tax on multinational enterprises' profit breaks down the profit of a multinational enterprise into two components: A routine or normal profit and a residual or excess profit, which also corresponds to economic rent, pure or windfall profit (see Hebous et al., 2022 or Beer et al. 2023). Some progressivity may then emerge if the second component (excess profit or rent) is taxed at a higher rate than the first one (normal profit).

Taxing rent at a higher rate is not distortionary, at least theoretically. An example is the extractive industries that may support some resource rent tax (as in Australia, Ghana, or Norway). In this sector, a progressive tax regime aims to capture windfall revenue resulting from a boom in commodity prices. The progressivity of the mining or petroleum tax regimes allows an automatic increase of the share of the State in natural resource rent in case commodity prices increase (Boadway and Keen, 2010). It improves the stability of tax regimes by reducing the risk of renegotiation and expropriation. However, beyond extractive industries, a progressive CIT remains a debatable issue. Indeed, the definition of economic rents that would justify higher tax rates may be more challenging to establish in economic sectors that do not rely on exploiting non-renewable resources.

To appreciate the progressive or regressive dimension of each country's tax incentive regime, we follow Djankov et al. (2010) and, more broadly, the *Doing Business* report approach.⁸ We

⁴ Avi-Yonah (2022) emphasizes that the brackets fixed in 1993 were not adjusted for inflation. The top rate of 35 percent, which corresponds to a taxable income of 100,000 USD or more, concerns many firms, hiding the progressive nature of the US CIT.

⁵ CIT rates are 10 percent for taxable income below 300,000 MAD (Moroccan Dirham or equivalent USD 81,680), 20 percent from 300,000 MAD to 1,000,000 MAD (or USD 272,265), and 31 percent above 1,000,000 MAD.

⁶ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52022PC0473&from=EN>

⁷ See: <https://www.oecd.org/tax/oecd-releases-detailed-technical-guidance-on-the-pillar-two-model-rules-for-15-percent-global-minimum-tax.htm>

⁸ The World Bank Group adopted this approach to compute some indicators in its yearly Doing Business survey.

compute a representative firm's Effective Average Tax Rate (EATR) with and without investment tax incentives. We estimate EATRs when the gross profitability of the firm increases from 1 to 60 percent or more.⁹ This allows us to appreciate the redistributive power of the general tax code and the main tax incentive regime.

We establish that CIT holidays represent a poor form of tax incentives. They are regressive by favoring the most profitable firms. CIT exemptions are not capped and automatically provide more tax advantages to more profitable firms. These incentives may even trigger the switch from a progressive standard tax regime to a regressive incentive tax regime, for instance, in Burkina Faso, Chad, Congo DR, Djibouti, and Nigeria. Therefore, they are highly redundant since they favor firms with the highest probability to invest even without any tax incentive, an issue already raised in UNIDO (2011).¹⁰ By contrast, we show that CIT credits are a better incentive tool than exemptions: They can induce the same decrease in total tax burden as CIT exemptions for a given level of profitability; They preserve and even restore the tax system's progressivity.

Besides its progressivity, tax credit displays several other advantages relative to CIT exemption. First, tax credit involves a more limited tax expenditure since it corresponds to a given percentage of eligible investment, while the CIT exemption induces significant tax expenditure for the government, particularly for highly profitable firms. Secondly, tax credit improves unambiguously the targeting property of national incentive mechanisms since it can address directly relevant investment, while CIT exemption concerns firms and not specific investments. Thirdly, the tax credit is more transparent than the CIT exemption. It involves information disclosure after investments are completed or at least partly made, while CIT exemption is provided only through some statements of investments' intents. Replacing CIT exemption with CIT credit would also transfer the burden of the proof from the Investment Promotion Agency or the tax administration to beneficiary firms: The latter would have to claim their tax credits when they fill out their CIT return. Finally, tax credits reinforce the Ministry of Finance's (MoF) taxing power, given the central role of the tax administration in monitoring this type of tax incentive. Indeed, Investment Promotion Agencies (IPAs) generally report to other Ministries

⁹ These rates are chosen following the distribution of profitability of small and medium African companies in the World Bank Enterprise Survey. They may be modified in the related web application (<https://shiny.mesocentre.uca.fr/app/citregressivity>) that allows replicating or modifying our analysis and any financial or tax parameter.

¹⁰ Based on a survey of 7,000 companies in 19 sub-Saharan African countries, UNIDO (2011) shows that the redundancy ratio (the probability that the same investments would have been undertaken even without any tax incentive) exceeds 70 percent in 10 countries.

or even the Prime Minister's office.¹¹ These institutional frameworks affect the supervisory role of the MoF on economic agents¹² requesting a reinforcement of intra-governmental coordination, which often fails.

Our analysis complements some previous works, such as Zee et al. (2002) and Klemm (2010), which provide a qualitative overview of the design of tax incentives, especially in developing countries. Zee et al. (2002) emphasize the weak effectiveness of tax incentives in attracting FDI in developing countries. The authors suggest prioritizing tax incentives such as investment allowances, tax credits, or accelerated depreciations, which ensure a faster recovery of investment costs. Klemm (2010) provides a set of criteria to evaluate tax incentives regimes. Beyond some principles such as efficiency, transparency, predictability, and stability, the author stresses that the impact of tax incentives in terms of equity is rarely studied. This equity consideration concerns individuals (capital owners), as in Gravelle and Zimmerman (1984). These authors highlight that U.S. preferential taxation under the Economic Recovery Tax Act of 1981 and the Tax Equity and Fiscal Responsibility of 1982 favored higher-income households. G20 (2015) emphasizes that "many low-income countries use costly tax holidays and income tax exemptions to attract investment, while investment tax credits and accelerated depreciation yield more investment per dollar spent. Finally, our approach is close to Boadway and Keen (2010), who study mining and petroleum tax regimes and suggest adopting a resource rent tax to improve progressivity.¹³ The rest of the paper is organized as follows: Section II presents our methodology, Section III displays our results, and Section IV concludes.

¹¹ From a joint survey conducted by the World Bank Group (WBG) and the World Association of Investment Promotion Agency (WAIPA), 32 percent of API report to the Ministry of Industry and/or Commerce, 14 percent to the Prime Minister's Office, and only 4 percent to the Ministry of finance (see Sanchiz and Omic, 2020).

¹² In some countries, such as Madagascar, the API provides Tax Identification Numbers to eligible firms without automatically exchanging information with the tax administration.

¹³ A commodity price boom significantly increases the profitability of extractive industries, justifying a progressive tax regime, which helps to avoid costly renegotiations.

II. Methodology

We appreciate the progressivity or regressivity of standard and incentive tax regimes in 44 African countries. The literature on tax systems' progressivity focuses mainly on PIT or the characteristics of the general tax system, with individuals or households as the studied taxpayer units (see, for instance, Diamond and Saez, 2011). This literature aims to address redistribution across individuals through taxation. Few works focus explicitly on the tax progressivity of corporations. Corporations belong ultimately to individuals, and addressing the redistributive capacity of PIT should be enough. However, CIT is an important backstopping mechanism for tax systems, mainly by withholding tax on dividends or capital gains paid to individuals (Bird, 2002). Moreover, CIT uses to be progressive, at least in the United States (see Avi-Yonah, 2020, 2022).

Our approach is essentially *de jure* in considering a representative mid-size firm operating in 44 African countries. We adopt a similar methodology to the one developed by Djankov et al. (2010), and that is used to build the Total Tax and Contribution Rate (TTCR) indicator of the *Doing Business* report:¹⁴ A representative firm produces and sells local ceramic flowerpots. It has 60 employees,¹⁵ (4 managers, 8 assistants, and 48 workers) and is owned by 5 tax residents of the studied country. Assets¹⁶ are building and land, machinery, one truck, ten computers, and other office equipment. The firm operates in the most important city of the country. It is liable to taxes charged at the local, state/provincial, and national levels. All the variables of the financial statements are multiple of the country's income per capita in local currency. Table 1 displays detailed financial information of the representative firm following Djankov et al. (2010). This information is expressed in multiplication factors of Gross National Income (GNI) per capita, allowing us to define yearly financial statements and taxable income.

A potential weakness of our approach and, more broadly, of the TTCR methodology is the representativeness of the hypothetical firm. This is one of the main criticisms of the *Doing Business* report, which was discontinued on September 16, 2021, after some scandals of data

¹⁴ This approach was very well known among experts working in developing countries. For instance, Besley (2015) emphasizes the *Doing Business* report's significant impact on policymakers and the academic world, with more than 2,000 published academic articles by 2013. Djankov (2016) explains the academic origin of the *Doing Business* indicators in a reply correspondence. See <https://archive.doingbusiness.org/en/methodology/paying-taxes> for a detailed description of the methodology.

¹⁵ Employees of the same hierarchical status earn the same wage.

¹⁶ All assets were bought on the same day.

manipulations.¹⁷ A new project named Business Enabling Environment (BEE)¹⁸ should replace the Doing Business Report. Alfaro et al. (2021) assess the strengths and weaknesses of the Doing Business approach and provide some recommendations for the forthcoming BEE report. The authors emphasize the issue of the representativeness of the hypothetical firm. A potential improvement would be considering several representative firms in each country as the BEE concept note proposes or giving up the case-study approach to collect data on a representative sample of firms. The latter solution means adopting a *de facto* view of national tax systems like the World Bank Enterprise Surveys (WBES). However, Alfaro et al. (2021) recognize that the *de jure* approach based on a case study remains "key for cross-country comparability." Moreover, the current WBES needs to provide more detailed information on firms' income statements and balance sheets to conduct our analysis. We confirm, nevertheless, that our firm belongs to the most representative medium-sized firm category in WBES (see Appendix A).

We restrict our analysis to the main statutory taxes that the firm is legally liable. We consider three tax instruments that make up most of the tax burden of the representative firm: CIT and its eventual minimum alternative, customs duties, and employer social contributions. This is a subset of the Doing Business TTCR indicator, including property taxes, property transfer taxes, dividend tax, capital gains tax, financial transactions tax, waste collection taxes, vehicle and road taxes, and other small taxes or fees. The new BEE approach will consider other taxes, such as VAT and payroll tax. This raises additional issues and controversies. For instance, it requires considering the economic incidence of each tax (see, for instance, OECD comments in W.B., 2022b, page 731). The subset of studied taxes simplifies our analysis without modifying our main message: CIT is levied on profit, which represents the "earnings before taxes" from the firm's financial statement; Customs duties tax on imported capital goods and intermediary consumption; Employer social contributions concern labor force. We do not consider property tax, which may be a local tax in some countries and remains poorly implemented in Africa (Franzsen and McCluskey, 2017).

Our study covers 44 African countries. The EATR, which captures the tax burden, is the net present value of annual taxes over the studied period divided by the net present value of the yearly gross profit. Following Djankov et al. (2010), we consider the representative firm's first

¹⁷ Zumbun and Talley (2018). World Bank unfairly influenced its own competitiveness rankings. *Wall Street Journal*. <https://www.wsj.com/articles/world-bank-unfairly-influenced-its-own-competitiveness-rankings-1515797620>.

¹⁸ See the concept note W.B. (2022a).

five years of economic activity. Moreover, we assume that the tax system remains unchanged over this period. We have:

$$EATR = \frac{\sum_{t=1}^5 \frac{T_t}{(1+d)^t}}{\sum_{t=1}^5 \frac{S_t - C_t - I_t}{(1+d)^t}}$$

where T_t , S_t , C_t , and I_t denote the sum of taxes, turnover, total cost, and investments in year t . The parameter d is the discount rate. Details such as assets' depreciation allowances are provided in the technical Appendix available online.

Table 1. Financial statement of the representative firm

A - Assumptions for the balance sheet

<i>Assets</i>		
Category	Multiplication Factor	Values for Algeria (USD)
Net Cash	20	71,400
Inventory	35	124,950
Accounts Receivable	50	178,500
Land	30	107,100
Building	40	142,800
Machinery	60	214,200
Truck	5	17,850
Computers	5	17,850
Office Equipment	5	17,850
Total Assets	250	892,500

<i>Liabilities</i>		
Category	Multiplication Factor	Values for Algeria
Short Term Debt	55	196,350
Accounts Payable – Trade	50	178,500
Long Term Debt	43	153,510

<i>Equity</i>		
Category	Multiplication Factor	Values for Algeria
Paid in Capital	102	364,140
Total Liabilities and Equity	250	892,500

B - Assumptions for the profit and loss statement

Category Multiplication	Multiplication Factor	Values for Algeria
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Sales	1050	5,355,000
Cost of Goods Sold	875	3,123,750
Managers	9 (= 2.25 per manager * 4)	32,130
Assistants	10 (= 1.25 per assistant * 8)	35,700
Workers	48 (= 1.00 per worker * 48)	171,360
Administrative Expenses	10	35,700
Advertising Expenses	10.5	37,485
Machinery Repair Expenses	3	10,710
Interest Expenses	5.5	19,635

Source: Authors' calculations based on data from Djankov et al. (2010).

III. Data

In this section, we present the general tax and investment codes. The main data sources for General Tax Codes are PWC tax summaries, Ernst and Young tax guides, and countries' general tax codes for 2020. We consider tax incentives for a medium-sized firm provided by the Investment Code or its equivalent.¹⁹

We also developed a web page (<https://shiny.mesocentre.uca.fr/app/citregressivity>), which complements our analysis allowing the replication of our findings and the inclusion of new countries. This webpage is interactive since it gives the possibility to modify parameters about the standardized firm as well as any tax parameter. The information about countries' tax instruments is chosen to reflect the situation as of 2020.

General Tax Code

We consider four main tax instruments in our analysis: CIT and its minimum alternative, named Minimum Income Tax (MIT), Employer Lump-sum contribution (ELC), and Customs duties (CD). Table 2 displays their respective standard rates in the 44 studied African countries in 2020.

- **Corporate Income Tax (CIT)** is based on each firm's profit. In most cases, profits correspond to "earnings before taxes" with some possible tax deductions. We then consider in our analysis that some taxes are deductible in determining the CIT base.²⁰ CIT statutory rates vary from 10 percent in Lesotho to 35 percent in Chad and Comoros, with an average value of 27 percent (Table 2).

¹⁹ Table 1 of the online Appendix provides information on each country's conditions and incentives data sources.

²⁰ See Table 2 of the online Appendix for the details of depreciation rules.

- **Minimum Income Tax (MIT)** is a tax due by companies on their turnover, and a nominal value may cap it. It is due when firms report losses or when CIT is lower than the application of the MIT rate to the reported turnover. Its rates range from 0 percent to 3 percent in Comoros, with an average value of 0.6 percent, and significantly differ between countries offering CIT exemptions and those offering CIT credits (Table 4).
- **Custom duties (CD)** are due on the Cost, Insurance, Freight (CIF) value of capital goods and intermediary consumption. Their rates vary from 0 percent to 30 percent in Algeria and Tunisia.
- **Employer Lump-sum Contribution (ELC)** summarizes all the taxes due by the firm on employees' wage bills. In Cameroon, for example, it includes land credit contributions at the rate of 2.5 percent and the fund for national employment at the rate of 1 percent. In Gabon, the complementary tax on salaries of 5 percent and the levy for the national habitat fund of 2 percent are considered. ELC rates vary between 0 to 10 percent in the Central African Republic.

Investment Code or Act

Investment Codes provide tax incentives by lowering tax liabilities to reduce the effective tax burden. Table 5 displays the main tax incentives for which our representative firm is qualified in 44 African countries.²¹ We have mainly three types of CIT incentives:

- **CIT exemption** is the most frequent tax incentive. Across our sample, CIT holidays are granted in 15 countries for various periods up to 5 years in Benin, Burkina Faso, Chad, Djibouti, Gabon, Gambia, Liberia, Morocco, and Nigeria (see Table 2).
- **CIT rate reduction** corresponds to preferential CIT rates, i.e., lower CIT rates relative to the standard rate. We also assimilate partial CIT exemption to CIT rate reduction. Our representative firm benefits from this type of incentive in 9 countries, including Angola, Botswana, Burundi, Cameroon, Comoros, Eswatini, Ghana, Mali, and Namibia.
- **Tax credits** are an incentive that reduces taxable bases under CIT (or other taxes) by a percentage (or the totality) of the invested amount. This tax incentive applies to our

²¹ We notice that Cabo Verde, Lesotho, Mauritania, Niger, Rwanda, Seychelles, Sierra Leone, South Africa, Tanzania, Tunisia, Uganda, and Zimbabwe do not provide any direct tax incentives for our representative firm. However, these countries may offer indirect tax and tariff duties advantages and direct tax incentives, including CIT exemptions for other types of firms such as exporters, firms located in rural areas, or active in specific economic sectors.

representative company in seven countries in our sample. Note that in some countries, the tax credit deduction for each year is capped at a given percentage of the tax liability. This is the case, for instance, in Madagascar and Senegal, where a tax credit of 50 and 40 percent of investment costs is granted with a maximum annual deduction limited to 50 percent of CIT liabilities in both countries.

In addition to CIT incentives, Investment Codes (or Acts) also provide indirect tax advantages, especially regarding customs duties or employer lump-sum contributions (Table 2). Several countries offer a full exemption of customs duties for a period varying from a few years to the total length of the project: Cabo Verde, Chad, Comoros, Ghana, Liberia, Mauritania, Mozambique, and Uganda. In contrast, other countries do not provide any customs duties advantage. In some countries (Botswana, Burundi, Comoros, Congo D. R., Djibouti, etc.), standard customs duties are zero, and no particular incentive is necessary.

Table 2. CIT, MIT, and Customs duties under the standard and incentive tax regimes

Country	Corporate Income Tax			Minimum Income Tax			Custom duties			Employer lump-sum		
	General Tax Code	Invest. Code	Length (Years)	General Tax Code	Invest. Code	Length (Years)	General Tax Code	Invest. Code	Length (Years)	General Tax Code	Invest. Code	Length (Years)
Algeria	19	0	3	0			30	30		2	2	
Angola	30	24	2	0			10	10		0		
Benin	25	0	5	1	0	5	5	0	1	4	2	5
Botswana	22	15	n.a.	0			0			0		
Burkina Faso	27.5	0	5	0.5	0.5		5	5		3	0	5
Burundi	30	28	n.a.	1	1		0			0		
Cabo Verde	22	22		0			5	0	n.a.	0		
Cameroon	33	16.5	10	2.2	1.1	10	5	0	1	3.5	3.5	
Central African Republic	30	0	3	1.9	1.9		5	5		10	10	
Chad	35	0	5	1.5	1.5		5	0	n.a.	1.2	1.2	
Comoros	35	15	7	3	3		0			5	5	
Congo	30	0	3	1	1		5	5		7.5	7.5	
Congo D. R.	30	0	3	1	1		0			0		
Cote d'Ivoire	25	Tax credit	n.a.	0.5	Tax credit	n.a.	5	5		2.8	Tax credit	n.a.
Djibouti	25	0	5	1	1		0			0		
Egypt	22.5	Tax credit	7	0			5	2	5	0		
Eswatini	27.5	10	10	0			0			0		
Ethiopia	30	0	4	0			0	0	4	0		
Gabon	30	0	5	1	1		5	5		7	7	
Gambia	27	0	5	1	0	5	5	0	5	0		
Ghana	25	18.75	n.a.	0			0			0		
Guinea	25	0	2	1.5	0	2	5	0	1	7.5	0	2
Kenya	30	Tax credit	n.a.	0			0			0		
Lesotho	10	10		0			0			0		
Liberia	25	0	5	2	2		5	0	n.a.	0		
Madagascar	20	Tax credit	n.a.	0.5	0.5		5	5		0		
Mali	30	25	7	1	1		5	3	5	3.5	3.5	
Mauritania	25	25		2.5	2.5		20	0	n.a.	0		
Mauritius	15	15		0			0			6	6	
Morocco	10, 20, 31	0	5	0.5	0.5		10	3	5	1.6	1.6	
Mozambique	32	Tax credit	5	0			0			0		
Namibia	32	18	10	0			0			0		
Niger	30	30		1	0	6	5	0	3	3	3	
Nigeria	30	0	5	0.5	0.5		0			0		
Rwanda	30	30		0			0			5	5	
Senegal	30	Tax credit	5	0.5	0.5		5	0	3	3	0	5
Seychelles	25	25		0			0			0		
Sierra Leone	30	30		0			5	5		0		
South Africa	28	28		0			0			0		
Tanzania	30	30		0.5	0.5		0			0		
Togo	27	Tax credit	5	1	1		5	0	5	0		
Tunisia	25	25		0.2	0.2		30	30		3	3	
Uganda	30	30		0			0			0		
Zimbabwe	24	24		0			0			0		

Note: n.a. not available

Source: Different countries general tax codes, Ernst and Young, Deloitte, KPMG, and PWC tax guides for 2020.

Table 3: Descriptive statistics of the different taxes

Variables	Obs.	Mean	Std. dev.	Min	Max
CIT	44	0.27	0.049	0.1	0.35
Minimum Income Tax	44	0.006	0.008	0	0.03
Employer lump sum contributions	44	0.018	0.026	0	0.1
Custom duties	44	0.044	0.068	0	0.3

Table 4: Descriptive statistics of the different taxes for the two studied tax regimes

	Mean values			T-test		
	<i>Exemption</i>	<i>Reduced rate</i>	<i>Tax credit</i>	<i>Exemption vs. Reduced rate</i>	<i>Exemption vs. Tax credit</i>	<i>Reduced rate vs. Tax credit</i>
CIT	0.28	0.29	0.27	-0.8708	-0.7281	-1.3019
MIT	.01	.008	.004	0.4496	-2.4318**	-0.9942
ELC	.029	.013	.008	1.2478	-1.5288	-0.5554
Custom duties	.057	.022	.036	1.3151	-0.7334	0.8428
Obs.	15	9	7	-	-	-

Note: T-test p-values: * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. The list of countries in each category is presented in Table 2.

The decision to offer tax incentives can be driven by different rationales, including investment, regional or sectoral development, employment, and social objectives. A simple review of incentives provisions listed in GTED identifies investment attraction or promotion as the most frequent policy objective in African countries, followed by developing priority sectors (see Appendix B).

These tax incentive regimes may require fulfilling some conditions on localization, investment amount, firm size, economic sector, or job creation. The details of these prerequisites for the considered representative firm are the following:

- **Localization.** In our case, our representative firm is localized by assumption in the capital city. In Egypt, for example, Cairo is included in Zone A, and the Egyptian law mentions

that 30 percent of investment costs are deductible for companies in that zone. We therefore consider a tax credit of 30 percent without any cap.

- **Investments amount.** Tax incentives may depend on the amount of investment. This is the case in Senegal, where the tax credit applies to companies with an investment level higher than 100,000,000 FCFA (185,988 USD). Our representative company invests 207,350 USD²² and is then eligible for the Senegalese tax credit.
- **Incentives based on firm size.** Our representative firm is a medium-sized company in terms of turnover and employees, which are the main size dimensions used in our sample countries. We therefore consider incentives applying to this type of firm. For instance, the Gabonese Investment Code offers a 5-year CIT exemption on medium-sized firms. Note that this firm size is closely related to investment amount in some countries. This is the case in Cote d'Ivoire, where companies with an investment amount lower than 200,000,000 FCFA (371,976 USD)²³ are classified as small and medium companies. Our representative firm has an investment amount of 330,600 USD.²⁴ In addition, even if the first level of the condition is an investment/firm size, a second level, depending on the location zone, may apply with different incentive packages for each zone.²⁵ As our representative company is in Abidjan, the capital city, it falls in zone A and thus benefits from a tax credit of 37.5 percent on CIT, the minimum CIT, and the employer lump sum contribution applicable until exhaustion. In Congo DR, given its low GNI,²⁶ our representative firm invests only 81,200 USD and is thus included in the small and medium companies' group, characterized by an investment level lower than 200,000 USD.
- **Sector-based incentives.** Our representative company is a manufacturing company. Therefore, we only consider incentives applying to the manufacturing sector. Ghana, for example, proposes a CIT exemption of 25 percent to manufacturing companies. Some countries refer to priority sectors, providing a list of these sectors. This is the case of Nigeria, whose pioneer status includes newly created manufacturing companies.
- **Employment-based condition.** In Burundi, for example, investors benefit from CIT reduced rates from 2 percentage points if they create 50 to 200 jobs to 5 percentage points

²² Given Senegal's GNI, the invested amount equals $[30+40+60+5+5+5=145] * 1,430$ USD.

²³ We considered the exchange rate on December, 31st 2020 which equals 1.22 EUR/USD (<https://www.banque-france.fr/statistiques/taux-de-change-parites-quotidiennes-31-dec-2020>).

²⁴ Invested amount in Cote d'Ivoire is equal to: $[30+40+60+5+5+5=145] * 2,280$ USD.

²⁵ Several countries in the sample employ a combination of these conditions.

²⁶ The low level of investment in the DRC is due to its low GNI per capita, equal to 560 USD in 2020.

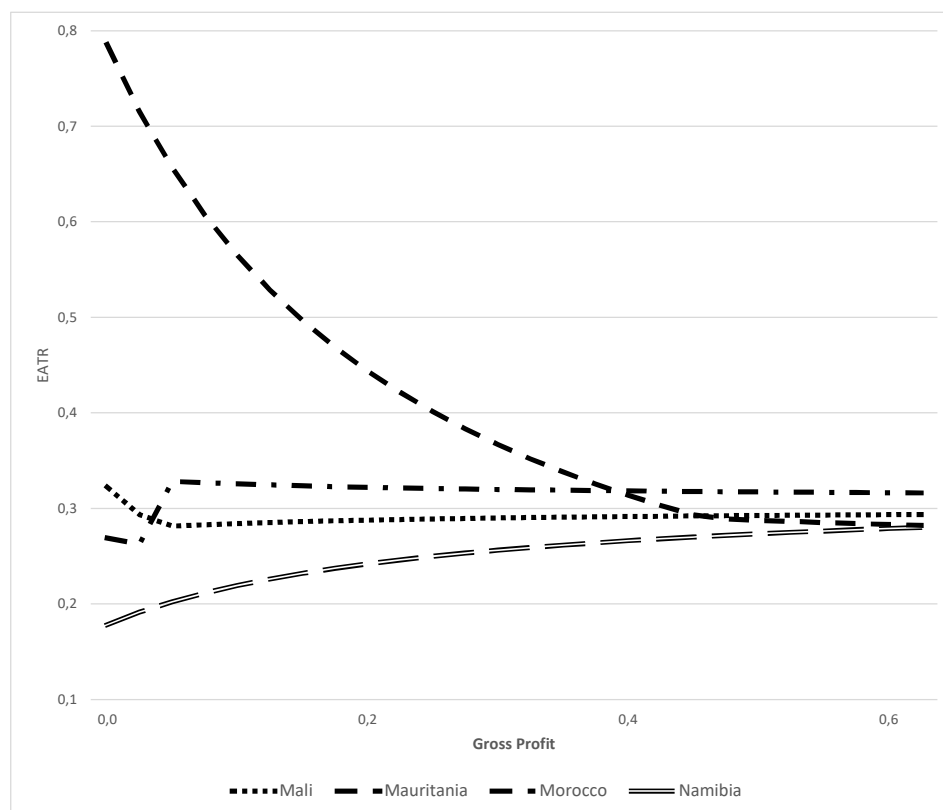
if they exceed 200 new jobs. As our representative firm employs 60 persons, we thus consider a reduced CIT rate of 28 percent instead of 30 percent.

IV. Results

The direct taxation of firms is usually considered proportional to the reported profit. However, we observe several profiles of EATRs under tax regimes that deviate from this proportionality rule (see Figure 1). In some countries, the EATR remains almost stable regardless of the firms' gross profitability. By contrast, other countries have a decreasing (Mauritania) or increasing (Namibia) EATR profile (see Figure 1). Finally, EATR may be non-monotonous, such as in Mali, i.e., decreasing for low levels of profitability and increasing above a sufficient gross profit level.

These profiles result directly from our assumptions. First, in addition to CIT, we consider some taxes paid on production factors (labor through ELC and capital investment through tariffs on imported equipment goods). These tax payments remain constant in our simulations since the variation of the firm's profitability is only driven by the prices of sold goods. These assumptions involve some regressivity since the ratio of these taxes to gross profit decreases in the latter. Second, we consider five years for our analysis. Depreciation allowances for initial investments decrease over the period if they are degressive (and not linear). Consequently, CIT revenue increases automatically. Highly profitable firms report taxable profit sooner over the studied 5-year period. We may observe some progressivity of the EATR, as in the case of Namibia, which applies degressive depreciation allowances for buildings. Finally, some countries have a dual approach for CIT, which is the maximum value between a tax on profit and a turnover tax (MIT). When pre-tax profits are sufficiently high, the tax on profits replaces the turnover tax. This switch explains the non-monotonicity of some observed EATR profiles.

Figure 1: The profile of EATR in Mali, Mauritania, Morocco, and Namibia under the standard tax regime



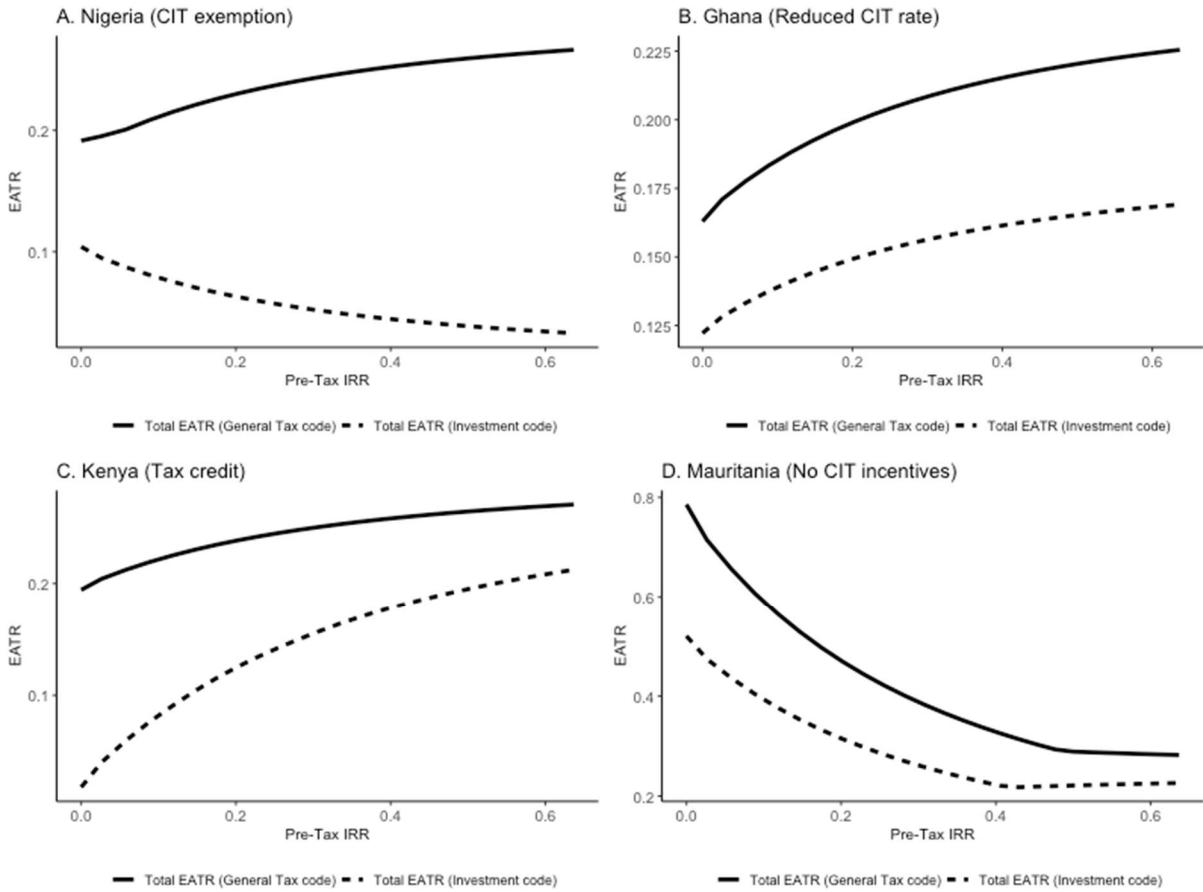
Source: Authors' calculations.

Appendix C displays the EATR for before-tax profitability of 1 percent, 10 percent, 21 percent, 37 percent, and 64 percent under standard and incentive tax regimes.²⁷ Under the standard tax code, the average tax burden is 27.2 percent for a low-profitable firm (with 10 percent gross profit). It decreases to 20.7 percent under the tax incentive regime. We observe a significant heterogeneity of the EATRs across countries. The tax burden under the standard tax regime exceeds 50 percent in two countries for low profitable firms: Comoros and Mauritania, while Lesotho, Mauritius, Botswana, Eswatini, Ghana, and Seychelles display the lowest tax burden (respectively 8.3, 16.6, 16.7, 17.7, 18.5, and 18.6 percent). This heterogeneity remains important for any rate of gross profitability. Tax incentive regimes decrease the tax burden on average by 7.2 percentage points. We observe significant variations across countries. The most generous countries are Chad, Gambia, and Mauritania, whose respective incentive regime decreases the EATR by 29, 22.2, and 19.7 percentage points for profitable firms.

²⁷ The pre-tax profitability rates of 1, 10, 21, 37, and 64 percent represent the quintiles of profitability of small and medium African companies in the World Bank Enterprise Survey.

Figure 2 displays the EATR profiles corresponding to the four main tax incentives: CIT exemption, CIT rate reductions, CIT credit, and no CIT incentive. Nigeria has a progressive standard tax regime, while its incentive regime that provides CIT exemption is regressive. By contrast, Ghana, which offers a reduced CIT rate, has progressive standard and incentive tax regimes. A similar reasoning applies to Kenya, which provides CIT credit. Finally, Mauritania does not provide any CIT incentives but customs duties exemption. Its standard and incentive tax regimes are regressive.

Figure 2: The profile of EATR in Ghana, Kenya, Mauritania, and Nigeria under the standard and incentive tax regimes²⁸



Source: Authors’ calculations.

Low-profitable firms bear a higher tax burden in 15 of the 44 studied countries than highly profitable firms under the standard tax code. Under tax incentives regimes, the number increases to 20. Most countries with a regressive (progressive) standard tax regime also have

²⁸ Pre-tax IRR (Internal Rate of Return) corresponds to the before-tax profit and is computed by increasing firms’ turnovers without any other change.

regressive (progressive) incentive regimes. In Algeria, Central African Rep., Comoros, Liberia, Mauritania, and Tunisia, which have regressive standard and incentive tax regimes, the tax burden differential between a low profitable firm (with a gross return of 10 percent) and a high one (with a gross return of 64 percent) under the General Tax Code is superior to ten percent (see Appendix C). These countries (except Algeria) raise MIT at a relatively high rate. Their respective incentive tax regimes do not modify this tendency of taxing less the most profitable firms. Angola, Burkina Faso, Chad, Congo D. R., Djibouti, and Nigeria have a progressive standard tax regime, while their incentive regime is regressive. One particularity of these countries is that they grant CIT exemption. By contrast, Madagascar and Niger have a regressive standard tax regime and a progressive incentive system.

We replicate our analysis considering only CIT and MIT. Tax advantages regarding customs duties and ELC decrease the cost of production (importations or labor). These tax benefits are identical in terms of saving amounts for firms and tax expenditure for governments, whatever the firms' gross profitability. Excluding these tax advantages from our analysis clarifies our main result regarding CIT incentives. Appendix D displays the shape of EATRs under standard and incentive tax regimes for countries providing CIT exemptions, namely Algeria, Benin, Burkina Faso, Central African Republic, Chad, Congo, Congo D. R., Djibouti, Ethiopia, Gabon, Gambia, Guinea, Liberia, Morocco, and Nigeria. The EATR is regressive for almost all the countries except Algeria, Ethiopia, and Guinea. In these countries, the CIT exemption length is shorter than the 5 years considered for the EATR computation, respectively 3 years in Algeria, 4 years in Ethiopia, and 2 years in Guinea. This means that CIT applies for the 2 (1 and 3, respectively) remaining years in Algeria (Ethiopia and Guinea, respectively), explaining the progressivity of the tax incentive regime.

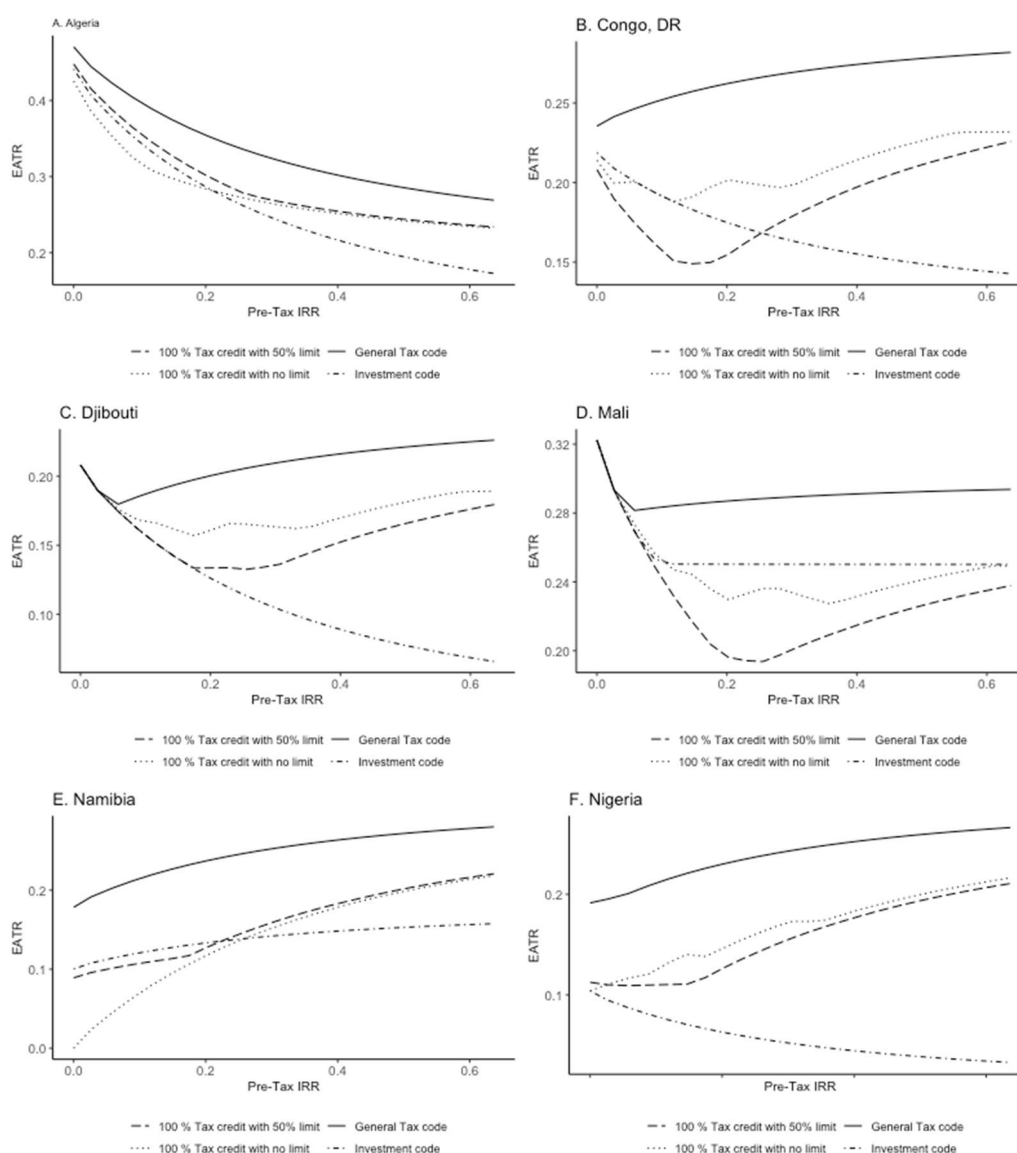
An alternative to CIT exemption is a tax credit, which can provide the same reduction of EATR for a given firm's profitability rate. One crucial advantage of tax credits is to secure the progressivity of the incentive tax regime. Côte d'Ivoire, Egypt, Kenya, Madagascar, Mozambique, Senegal, and Togo are countries implementing tax credits. Appendix E displays the shape of their respective EATRs (including the four main taxes), which are mainly increasing.²⁹ To confirm this result, we run two simulations considering a limited and unlimited investment tax credit of 100 percent deductible from the CIT base (see Figure 3). We consider 6 countries: Algeria, Congo D. R., Djibouti, Mali, Namibia, and Nigeria.³⁰

²⁹ EATR is non-monotone for Cote d'Ivoire, Madagascar, and Togo.

³⁰ Our related website allows producing similar figures for any of the 44 studied African countries.

- The standard tax regime in Congo D. R., Djibouti, Mali, and Nigeria is progressive, while the incentive regime is regressive. In these three countries, tax credits can reduce the total tax burden in the same amount (and even more) than tax exemptions, which current national investment codes propose (see Figures 3.B, 3.C, 3.D, and 3.F). Moreover, tax credits improve or restore the progressivity of the incentive regimes (increasing tax burden with gross profit).
- In Namibia, both tax regimes (standard and incentive) are progressive. The main tax incentive in Namibia is a reduced CIT rate of 18 percent instead of 32 percent. Replacing this with tax credits would improve the progressivity of the incentive regime for firms with a gross margin above 23 percent (see Figure 3.E).
- Algeria has regressive standard and incentive tax regimes. Introducing tax credits does not allow for establishing the tax system's progressivity (Figure 3.A). Algeria and similar countries raise customs duties and/or ELC with particularly high rates involving regressive tax regimes. When we focus only on CIT, we notice that the tax credit improves the progressivity of the CIT alone (see Figure 3.A).

Figure 3: Tax reform simulation results



The intuition of our results is the following: Tax credit advantage is capped by the invested amount or targeted expenditures.³¹ Tax credits allow investors to deduce a percentage of investment costs from the taxable profit under CIT at each period until exhaustion. For instance, let us consider a tax credit of 100 percent on investment with a deduction limited to 50 percent of the taxable income in Nigeria (see Figure 3.F). For a low-profitable firm, a tax credit reduces taxable profit by 50 percent throughout the entire period, i.e., five years. For a very profitable firm (with a 37 percent gross profit), a tax credit reduces the CIT base for a shorter period by 50 percent in the first three years and 7 percent in the fourth year. The profitable firm starts paying a full CIT in the 5th year following the investment. Over the five years, the profitable

³¹ Eligible expenditures may include research and development spending or young employee wages.

firm would bear a relatively higher tax burden than the less profitable firm: Its pre-tax cash flows are 47.5 percent higher, while its tax liabilities are 114.5 percent higher.³² The tax incentive regime is then progressive.

Unlike tax credits, the exemption does not consider the level of taxable profit. This tax advantage is thus not capped: Firms do not pay any income tax over a given period, whatever their respective profitability levels. However, firms may remain subjugated to MIT based on turnover. A very profitable firm pays 3.6 percent more taxes, while its pre-tax cash flow is 47.5 percent higher than a less profitable firm.³³ As a result, a very profitable firm supports a lower tax burden, explaining the regressivity of the tax incentive regime under CIT exemptions.

We also notice a counter-intuitive result in some countries such as Congo D. R., Djibouti, Mali, and Nigeria (see Figure 3): The 50 percent limit for tax credit induces a lower tax burden than the unlimited tax credit. The dual mechanism of CIT presented in Table 5 explains this finding. The representative firm pays the MIT during the first three years when the tax credit is not limited. It starts paying CIT in the form of profit taxes in the fourth year. In contrast, establishing a 50 percent limit on the tax credit deduction allows the company to spread this credit deduction over a more extended period, reducing the final total tax burden.

Table 5. Description of the tax credit mechanism for Nigeria

A - CIT calculation considering a tax credit (TC) corresponding to 100 percent of investments with no deduction limitation

Year	Sales	Earning Before Interest and Tax (EBIT)	Possible Deductible TC (PDTC) (No limitation = 100% of EBIT)	Available Tax Credit (ATC) ATC (t-1)-DTC (t-1)	Deductible Tax Credit (DTC) ATC not exceeding PDTC	CIT Taxable Base (CITTB) EBIT-DTC	Corporate Income Tax (CIT) 30%*CITTB	Minimum Income Tax (MIT) 0.5%*Sales	Final CIT amount Max(CIT,MIT)
1	2,100,000	78,500	78,500	290,000	78,500	0	0	10,500	10,500
2	2,100,000	113,425	113,425	211,500	113,425	0	0	10,500	10,500
3	2,100,000	131,674	131,674	98,075	98,075	33,599	10,080	10,500	10,500
4	2,100,000	141,099	141,099	0	0	141,099	42,330	10,500	42,330
5	2,100,000	142,205	142,205	0	0	142,205	42,661	10,500	42,661
<i>Total</i>									<i>116,491</i>

B - CIT calculation considering a tax credit (TC) corresponding to 100 percent of investments with a deduction limitation of 50 percent

Year	Sales	Earning Before Interest and Tax (EBIT)	Possible Deductible TC (PDTC) (Limitation = 50% of EBIT)	Available Tax Credit (ATC) ATC (t-1)-DTC (t-1)	Deductible Tax Credit (DTC) ATC not exceeding PDTC	CIT Taxable Base (CITTB) EBIT-DTC	Corporate Income Tax (CIT) 30%*CITTB	Minimum Income Tax (MIT) 0.5%*Sales	Final CIT amount Max(CIT,MIT)
1	2,100,000	78,500	39,250	290,000	39,250	39,250	11,775	10,500	11,775
2	2,100,000	113,425	56,713	250,750	56,713	56,713	17,014	10,500	17,014
3	2,100,000	131,674	65,837	194,038	65,837	65,837	19,751	10,500	19,751
4	2,100,000	141,099	70,550	128,201	70,550	70,550	21,165	10,500	21,165
5	2,100,000	142,205	71,102	57,651	57,651	84,554	25,366	10,500	25,366
<i>Total</i>									<i>95,071</i>

Table 6 displays tax expenditure estimates from the GTED database. We notice that CIT expenditures are higher in countries that provide tax credits. This result may appear paradoxical. However, it may also illustrate another undesirable feature of CIT exemption. Indeed, in the

³² See online Technical Appendix 5.

³³ See online Technical Appendix 4.

most common procedure in providing investment incentives, IPA provides the agreement to investors that respect the required conditions to benefit from the tax incentive regime. Thus, these investors obtain exemptions on the aim to invest, which may involve an ex-post audit done by IPA. However, IPA may have insufficient human resources to do adequately these controls. In some cases, tax-exempted firms do not fill their income tax statements. By contrast, the CIT credits mechanism fully involves the tax administration, and they are provided when investments are made or at least engaged. CIT exemptions induce a higher risk of information losses in terms of tax revenue foregone than CIT credits. This difference explains why CIT expenditures are lower with CIT exemptions than CIT credits.

Table 6. Tax expenditures and CIT incentives

Country	GTED coverage (% of GDP)				CIT incentives				
	Last covered Year	Exemption	Tax credit	Total	Covered in the GTED	Tax year	Exemption	Reduced rate	Tax credit
Algeria					No	2020	Yes	No	No
Angola					No	2020	No	Yes	No
Benin	2019	0,02		0,03	Yes	2020	Yes	No	No
Botswana					No	2020	No	Yes	No
Burkina Faso	2018	0,05		0,17	Yes	2020	Yes	No	No
Burundi					No	2020	No	Yes	No
Cabo Verde	2019	0,19	0,33	0,65	Yes	2020	No	No	No
Cameroon	2018	0,01	0,01	0,05	Yes	2020	No	Yes	No
CAR					No	2020	Yes	No	No
Chad					No	2020	Yes	No	No
Comoros					No	2020	No	Yes	No
Congo					No	2020	Yes	No	No
Congo DR	2017			0,1	Yes	2020	Yes	No	No
Cote d'Ivoire					No	2020	No	No	Yes
Djibouti					No	2020	Yes	No	No
Egypt					No	2020	No	No	Yes
Eswatini	2017		0,05	0,05	Yes	2020	No	Yes	No
Ethiopia					No	2020	Yes	No	No
Gabon					No	2020	Yes	No	No
Gambia					No	2020	Yes	No	No
Ghana					No	2020	No	Yes	No
Guinea	2018			0,26	Yes	2020	Yes	No	No
Kenya					No	2020	No	No	Yes
Lesotho					No	2020	No	No	No
Liberia					No	2020	Yes	No	No
Madagascar	2017	0		0,14	Yes	2020	No	No	Yes
Mali					No	2020	No	Yes	No
Mauritania	2013			0,23	Yes	2020	No	No	No
Mauritius	2019	0,25	0	0,59	Yes	2020	No	No	No
Morocco	2019	0,26		0,43	Yes	2020	Yes	No	No
Mozambique					No	2020	No	No	Yes
Namibia					No	2020	No	Yes	No
Niger					No	2020	No	No	No
Nigeria					No	2020	Yes	No	No
Rwanda	2019	0		0,34	Yes	2020	No	No	No
Senegal	2014	0,42		0,43	Yes	2020	No	No	Yes
Seychelles	2019		0,62	0,62	Yes	2020	No	No	No
Sierra Leone					No	2020	No	No	No
South Africa	2018	0,07		0,25	Yes	2020	No	No	No
Tanzania					No	2020	No	No	No
Togo					No	2020	No	No	Yes
Tunisia					No	2020	No	No	No
Uganda					No	2020	No	No	No
Zimbabwe					No	2020	No	No	No
Total					15		15	9	5
Percentage					34%		34%	15,90%	16%

Note: Data on tax incentives comes from different sources including general tax codes and laws, investment codes and laws, Ernst and Young, PWC, Deloitte, and KPMG reports on taxation.

The other data comes from the Global Tax Expenditures Database (GTED).

V. Conclusion

This study evaluates the progressivity of tax regimes in 44 African countries. Following Djankov et al. (2010), we determine the EATR of a representative firm under the standard and investment regimes. We then measure the variation in the EATR when the gross profitability of the firm increases. We deduce the progressivity or regressivity of the national general tax code and the main tax incentives regime. We establish that CIT exemptions are a particularly poor form of tax incentives since they may reverse the progressivity of national tax regimes by favoring the most profitable firms. This tax advantage is highly redundant since it boosts the revenue of firms that would have invested without these incentives. Under tax incentives regimes, 20 out of the 44 countries present a regressive EATR profile, with 65 percent of them using tax exemptions as their main incentive instrument. By contrast, we show that an alternative incentive mechanism, i.e., CIT credits, can not only reduce the tax burden as CIT exemptions do, but they may also restore the tax system's progressivity by taxing relatively more profitable firms.

The GTED database shows that CIT expenditures are more important in countries with a CIT credit mechanism than countries offering CIT exemptions. This observation may appear counter-intuitive. However, it is an illustration of another weakness of the CIT exemption mechanism: The lack of accurate information and effective monitoring of eligible firms by the tax administration. This incentive involves a high risk of fraud or abuse and significant complexities in monitoring and evaluating induced tax expenditures. The tax administration has only a marginal role in providing and managing this type of incentives relative to Investment Promotion Agencies. Meanwhile, these agencies have a limited capacity to enforce the eligibility conditions of derogatory regimes and often fail to control the effectiveness of investment. By contrast, tax credits involve firms reporting their profit to the tax administration to benefit from them. In this case, investments are carried out, while CIT exemptions are granted on the intention only to invest. Tax credits mechanism (as depreciation allowances) does not involve any additional compliance cost for the firm as long as the latter fulfills its tax report obligations. Finally, tax credits also reinforce the taxing power of the MoF since IPAs across the World report to other Ministries or even to the Prime Minister's office.

Some countries, such as India, managed to move away from CIT holidays. The Standing Committee on Finance of Parliament reviewed the Indian direct taxes in 2012. It recommended switching from profit-based incentives (e.g., CIT holidays or CIT reduced rates) to investment-based incentives (e.g., CIT credit). The Indian authorities emphasized several pitfalls of their

current tax incentive mechanisms, such as induced distortions,³⁴ an important source of tax litigation and a transfer of revenue to foreign residence countries in case of FDI.

However, CIT holidays, unfortunately, remain frequent in developing countries. This tax incentive mechanism may appear more straightforward and attractive to the authorities, but this is unambiguously an error in attracting investments and promoting sustainable growth. The OECD Pillar II, which should impose a minimum CIT on multinational enterprises, may reduce the interest of such tax incentives. In addition, CIT holidays can expose developing countries to the risk of being blacklisted. For instance, Morocco was removed from the European Union's tax haven grey list on February 21, 2021. One of the main reasons was the modifications of the derogatory tax regime of the Casablanca Finance City, which included CIT exemption for five years.

The representativeness of the studied firm limits the scope of our analysis. For instance, we do not address particular issues raised by extractive industry and more broadly by multinational companies that may generate a large share of taxable profit in our sample of countries. Therefore, we do not consider aggressive tax planning and profit shifting practices. However, the online application related to this article allows replicating our results and may also be used to compute the EATR for other types of firms by modifying assumed costs and financial structure. It can also be a tool for policymakers to run simulations for different scenarios concerning their tax incentive regimes.

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Data availability: The datasets generated and analysed during the current study are available at <https://shiny.mesocentre.uca.fr/app/citregressivity>.

³⁴ The Indian authorities stress, in particular, "artificial creation of profits and transfer from the non-exempt unit to the exempt unit" and closing and re-opening businesses to extend the period of tax holidays.

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Appendices

Appendix A: The typical representative company in Africa from World Bank Enterprise Surveys (WBES)

We explore the distribution of firms by sector, size, and legal status from World Bank Enterprise Surveys (WBES). Table A.1 presents the distribution of firms by sector. The distribution of firms in the studied countries is similar to that of the world. Considering only the latest survey in each studied country, 9,559 (44 percent) firms are in the manufacturing sector. Manufacturing firms are, therefore, the most common type of firm.

When we consider the distribution of manufacturing firms by size in our sample, we note that small firms are dominant (Table A.2). However, these small firms are not eligible for investment incentives. We thus exclude companies with sole proprietorship status. We notice that medium-sized companies represent the largest category of firms, i.e., 41 percent of the sample. Consequently, our choice of representative firm, i.e., a medium size firm operating in the manufacturing sector, is justified. This choice corresponds also to the *Doing Business* representative firm.

Table A.1: Firms distribution by sector of activity in WBES (percentage).

	Whole E.S. (percentage)	Studied countries (percentage)	Latest survey in studied countries (percentage)
Manufacturing	52	48	44
Services	19	18	18
Other	29	35	38

Source: Authors' calculations based on WBES.

Table A.2: Manufacturing firms' distribution by size measured by the number of employees (Small, Medium, and Large) and legal status in the latest survey of studied countries.

Legal Status	Small (<20)	Medium (20-99)	Large (100 and above)	Total
Shareholding company with shares trade in the stock market	94	190	275	559
Shareholding company with non-traded shares or shares traded privately	385	696	557	1,638
Sole proprietorship	3,309	1,206	419	4,934
Partnership	432	468	210	1,110
Limited partnership	334	461	277	1,072
Other and do not know (Spontaneous)	67	100	79	246
Total	4,621	3,121	1,817	9,559
Total excluding Sole proprietorship	1,312	1,915	1,398	4,625

Source: Authors' calculations based on WBES.

Appendix B: Policy objectives of tax incentives in Africa

Policy Objective	Number of tax expenditure provisions	Percentage
Attract/Promote investment	82	18.9
Develop a priority economic sector or activity	59	13.6
Increase access to/demand for goods and services	29	6.7
Multiple policy objectives	9	2.1
Not stated/unclear	209	48.3
Other social/economic objectives	33	7.6
Promote environmental sustainability	1	0.2
Support specific subgroups of the population	11	2.5
Total	433	100

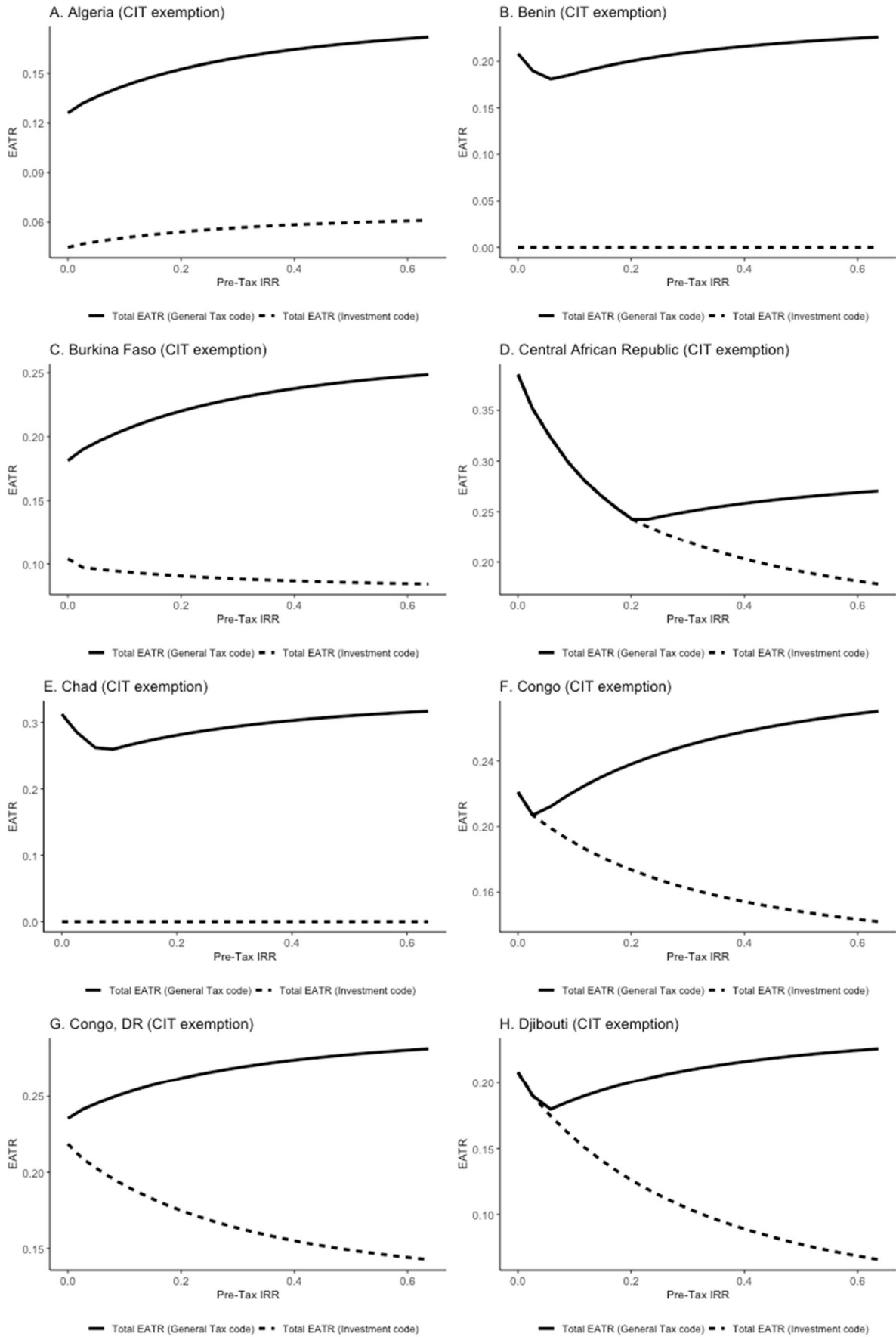
Source: The Global Tax Expenditures Database (GTED).

Appendix C. The EATR under standard and incentive tax regimes

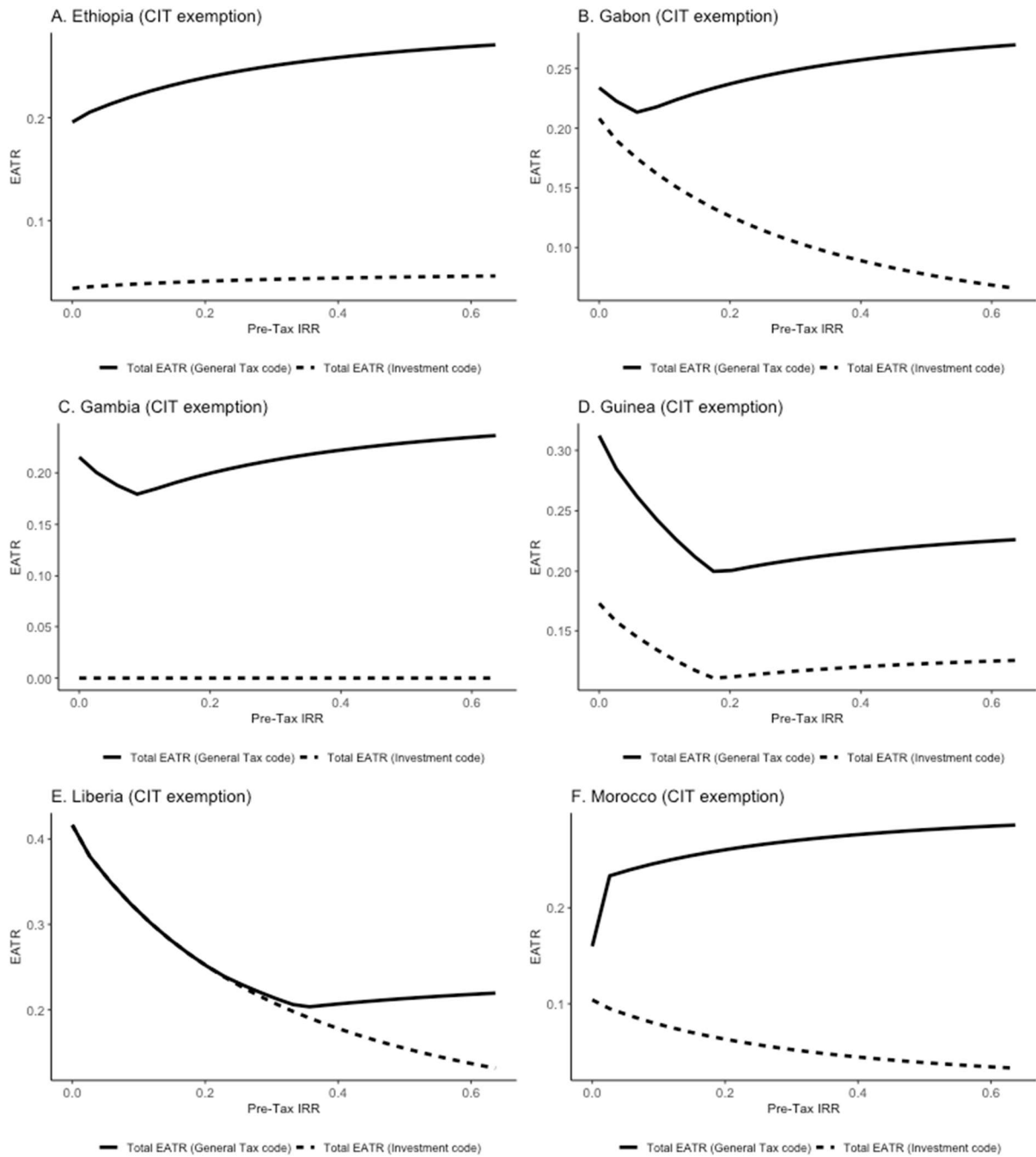
Country	1 percent		10 percent		21 percent		37 percent		64 percent		GTC	IC	CIT incentive		
	GTC	IC	GTC	IC	GTC	IC	GTC	IC	GTC	IC			Exempt.	Reduced rate	Tax credit
Algeria	45.7	42.3	39.8	34.5	35.1	28.2	30.8	22.4	26.9	17.2	Reg.	Reg.	Yes	No	No
Angola	28.9	27.8	29.1	27.7	29.3	27.6	29.5	27.5	29.7	27.5	Prog./Stable	Reg./Stable	No	Yes	No
Benin	31.4	7.5	25.4	5.8	25.3	4.5	25.2	3.3	25.2	2.2	Reg.	Reg.	Yes	No	No
Botswana	15.2	10.3	16.7	11.4	17.9	12.2	19.0	12.9	20.0	13.6	Prog.	Prog.	No	Yes	No
Burkina Faso	26.0	16.2	26.3	13.9	26.6	12.5	26.8	11.3	27.1	10.1	Prog.	Reg.	Yes	No	No
Burundi	23.8	23.3	25.2	24.7	26.3	25.7	27.3	26.7	28.2	27.6	Prog.	Prog.	No	Yes	No
Cabo Verde	19.6	14.7	20.1	16.3	20.6	17.6	20.9	18.8	21.3	19.8	Prog./Stable	Prog.	No	No	No
Cameroon	54.5	31.2	43.0	24.6	33.8	19.4	33.2	18.5	33.1	17.8	Reg.	Reg.	No	Yes	No
Central African Republic	56.0	56.0	44.1	44.1	35.0	35.0	31.6	28.4	31.1	22.9	Reg.	Reg.	Yes	No	No
Chad	37.7	1.6	30.2	1.2	31.3	0.9	32.3	0.7	33.2	0.5	Prog.	Reg./Stable	Yes	No	No
Comoros	66.1	66.1	52.2	52.2	41.0	41.0	31.9	30.8	32.9	21.6	Reg.	Reg.	No	Yes	No
Congo	36.6	36.6	30.9	30.2	30.7	25.9	30.5	22.0	30.4	18.4	Reg.	Reg.	Yes	No	No
Congo DR	23.9	21.4	25.2	19.1	26.3	17.4	27.3	15.7	28.2	14.3	Prog.	Reg.	Yes	No	No
Cote d'Ivoire	24.4	22.5	24.5	21.4	24.6	21.7	24.7	21.9	24.8	22.9	Prog./Stable	Reg./Prog.	No	No	Yes
Djibouti	19.9	19.9	18.7	15.7	20.2	12.4	21.5	9.3	22.6	6.6	Reg./Prog.	Reg.	Yes	No	No
Egypt	21.2	14.0	21.5	15.8	21.7	17.3	21.9	18.7	22.1	20.0	Prog./Stable	Prog.	No	No	Yes
Eswatini	15.3	5.6	17.7	6.4	20.0	7.3	22.0	8.0	23.8	8.7	Prog.	Prog./Stable	No	Yes	No
Ethiopia	20.1	3.5	22.3	3.9	24.0	4.2	25.6	4.4	27.1	4.7	Prog.	Prog./Stable	Yes	No	No
Gabon	36.6	35.3	31.0	27.7	30.4	21.6	30.3	16.1	30.2	11.1	Reg.	Reg.	Yes	No	No
Gambia	26.8	0.0	22.2	0.0	22.9	0.0	24.0	0.0	25.0	0.0	Reg./Prog.	Stable	Yes	No	No
Ghana	16.7	12.5	18.5	13.9	20.0	15.0	21.3	16.0	22.6	16.9	Prog.	Prog.	No	Yes	No
Guinea	45.8	26.7	36.1	21.0	28.2	16.4	26.8	15.5	26.2	14.9	Reg.	Reg.	Yes	No	No
Kenya	20.0	3.0	22.2	8.2	24.0	12.8	25.6	17.2	27.0	21.3	Prog.	Prog.	No	No	Yes
Lesotho	7.8	7.8	8.3	8.3	8.7	8.7	9.0	9.0	9.4	9.4	Prog.	Prog.	No	No	No
Liberia	46.0	39.7	36.4	31.4	28.5	24.7	22.6	18.6	23.4	13.1	Reg.	Reg.	Yes	No	No
Madagascar	20.9	17.2	20.7	16.0	20.6	16.8	20.4	17.6	20.3	18.4	Reg./Stable	Reg./Prog.	No	No	Yes
Mali	30.7	30.7	28.4	25.0	28.7	25.0	29.1	25.0	29.4	25.0	Reg./Prog.	Reg./Stable	No	Yes	No
Mauritania	74.9	49.6	59.0	39.3	46.1	30.9	34.4	23.3	28.2	22.6	Reg.	Reg.	No	No	No
Mauritius	17.0	17.0	16.6	16.6	16.2	16.2	15.9	15.9	15.6	15.6	Reg./Stable	Reg./Stable	No	No	No
Morocco	26.6	24.3	32.6	19.1	32.3	14.8	31.9	11.0	31.6	7.5	Prog./Reg.	Reg.	Yes	No	No
Mozambique	25.3	24.2	26.8	25.9	27.9	27.3	29.0	28.6	30.0	29.7	Prog.	Prog.	No	No	Yes
Namibia	18.5	10.4	21.5	12.1	23.9	13.4	26.1	14.7	28.0	15.8	Prog.	Prog.	No	Yes	No
Niger	31.0	28.1	30.7	28.5	30.6	28.9	30.4	29.2	30.3	29.4	Reg./Stable	Prog./Stable	No	No	No
Nigeria	19.3	9.9	21.1	7.9	23.2	6.2	25.0	4.7	26.7	3.3	Prog.	Reg.	Yes	No	No
Rwanda	24.3	24.3	25.5	25.5	26.6	26.6	27.5	27.5	28.3	28.3	Prog./Stable	Prog./Stable	No	No	No
Senegal	27.4	14.9	28.0	17.9	28.5	20.5	28.9	23.0	29.2	25.3	Prog./Stable	Prog./Stable	No	No	Yes
Seychelles	16.8	16.8	18.6	18.6	20.1	20.1	21.4	21.4	22.6	22.6	Prog.	Prog.	No	No	No
Sierra Leone	23.8	23.8	25.1	25.1	26.2	26.2	27.2	27.2	28.2	28.2	Prog./Stable	Prog./Stable	No	No	No
South Africa	18.8	18.8	20.9	20.9	22.5	22.5	24.0	24.0	25.3	25.3	Prog./Stable	Prog./Stable	No	No	No
Tanzania	21.8	21.8	23.6	23.6	25.1	25.1	26.4	26.4	27.6	27.6	Prog./Stable	Prog./Stable	No	No	No
Togo	26.2	19.9	23.8	19.3	24.5	20.2	25.2	22.0	25.8	23.7	Reg./Prog.	Reg./Prog.	No	No	Yes
Tunisia	49.7	49.7	44.3	44.3	39.9	39.9	35.9	35.9	32.3	32.3	Reg.	Reg.	No	No	No
Uganda	21.2	21.2	23.2	23.2	24.7	24.7	26.1	26.1	27.4	27.4	Prog.	Prog.	No	No	No
Zimbabwe	19.7	19.7	20.7	20.7	21.4	21.4	22.1	22.1	22.7	22.7	Prog.	Prog.	No	No	No
Average	29.1	22.4	27.2	20.7	26.4	19.5	26.1	18.6	26.4	18.0					

Note: GTC: General Tax Code; IC: Investment Code.
Source: Authors calculations.

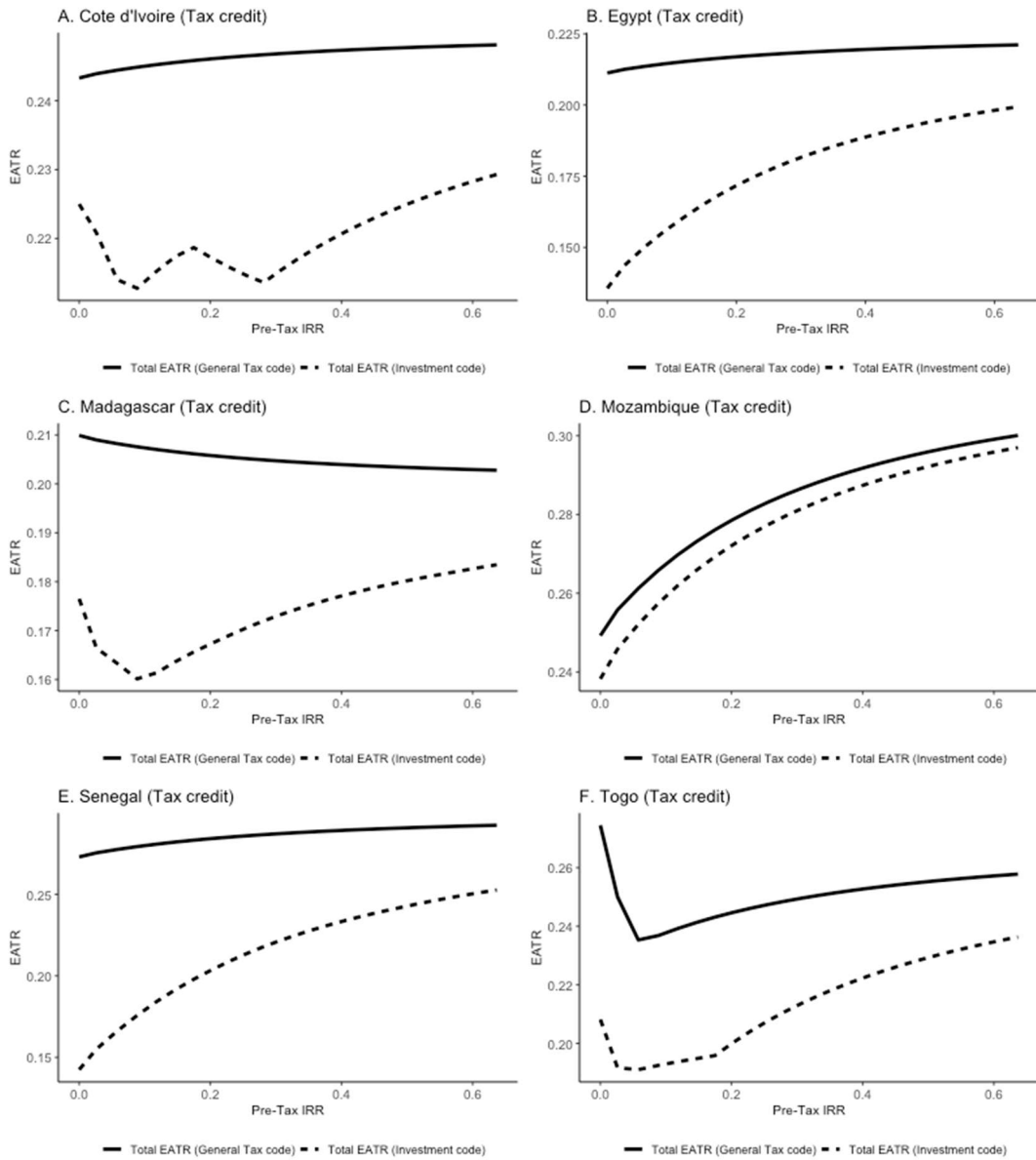
Appendix D: EATR profiles for CIT+MIT only in countries providing CIT exemption.



Appendix D: EATR profiles for CIT+MIT only in countries providing CIT exemption (continuation).



Appendix E: EATR profiles in countries providing CIT credit



Technical Appendices (available online)

Appendix 1. Assets' depreciation computation factors

Country	Buildings				Machinery				Trucks				Computers				Office equipments			
	Linear duration	Degrassive coefficient	First year degrassive rate	Other years degrassive rate	Linear duration	Degrassive coefficient	First year degrassive rate	Other years degrassive rate	Linear duration	Degrassive coefficient	First year degrassive rate	Other years degrassive rate	Linear duration	Degrassive coefficient	First year degrassive rate	Other years degrassive rate	Linear duration	Degrassive coefficient	First year degrassive rate	Other years degrassive rate
Algeria	20	1	0	0	5	1	0	0	5	1	0	0	5	1	0	0	10	1	0	0
Angola	25	1	0	0	3	1	0	0	4	1	0	0	3	1	0	0	10	1	0	0
Benin	20	1	0	0	5	1	0	0	3	1	0	0	2	1	0	0	10	1	0	0
Botswana	40	1	25	0	4	1	0	0	4	1	0	0	4	1	0	0	10	1	0	0
Burkina Faso	20	1	0	0	5	1	0	0	3	1	0	0	2	1	0	0	10	1	0	0
Burundi	20	1	0	0	10	1	0	0	99	1	25	25	99	1	50	50	99	1	25	25
Cabo Verde	20	1	0	0	5	1	0	0	5	1	0	0	3	1	0	0	3	1	0	0
Cameroon	20	1	0	0	10	1	0	0	3	1	0	0	4	1	0	0	10	1	0	0
Central Africa	20	1	0	0	4	1	0	0	3	1	0	0	4	1	0	0	10	1	0	0
Chad	20	1	0	0	5	1	0	0	5	1	0	0	3	1	0	0	10	1	0	0
Comoros	20	1	0	0	5	1	0	0	5	1	0	0	3	1	0	0	10	1	0	0
Congo	20	1	0	0	4	1	0	0	3	1	0	0	4	1	0	0	7	1	0	0
Congo DR	20	1	0	0	10	1	0	0	4	1	0	0	5	1	0	0	10	1	0	0
Cote d'Ivoire	20	1	0	0	5	1	0	0	3	1	0	0	2	1	0	0	10	1	0	0
Djibouti	20	1	0	0	5	1	0	0	5	1	0	0	3	1	0	0	10	1	0	0
Egypt	20	1	0	0	99	1	25	25	99	1	25	25	99	1	50	50	99	1	25	25
Eswatini	99	1	50	4	99	1	50	10	99	1	33.33	33.33	99	1	33.33	33.33	99	1	12.5	12.5
Ethiopia	20	1	0	0	5	1	0	0	5	1	0	0	4	1	0	0	5	1	0	0
Gabon	20	1	0	0	3	1	0	0	3	1	0	0	4	1	0	0	10	1	0	0
Gambia	20	1	0	0	3.33	1	0	0	3.33	1	0	0	2.5	1	0	0	5	1	0	0
Ghana	10	1	0	0	99	1	30	30	99	1	30	30	99	1	40	40	99	1	20	20
Guinea	20	1	0	0	5	1	0	0	5	1	0	0	3	1	0	0	10	1	0	0
Kenya	10	1	0	0	99	1	37.5	37.5	99	1	25	25	99	1	30	30	99	1	0	0
Lesotho	99	1	5	5	99	1	20	20	99	1	25	25	99	1	10	10	99	1	0	0
Liberia	15	1	0	0	3.33	1	0	0	3.33	1	0	0	3	1	0	0	2.5	1	0	0
Madagascar	20	1	0	0	10	1	0	0	4	1	0	0	4	1	0	0	10	1	0	0
Mali	20	1	0	0	5	1	0	0	3	1	0	0	2	1	0	0	10	1	0	0
Mauritania	20	1	0	0	5	1	0	0	4	1	0	0	4	1	0	0	10	1	0	0
Mauritius	20	1	0	0	99	1	35	35	99	1	25	25	99	1	50	50	99	1	20	20
Morocco	20	1	0	0	7	1	0	0	4	1	0	0	4	1	0	0	7	1	0	0
Mozambique	50	1	0	0	8	1	0	0	5	1	0	0	4	1	0	0	10	1	0	0
Namibia	99	1	20	8	3	1	0	0	3	1	0	0	3	1	0	0	3	1	0	0
Niger	20	1	0	0	10	1	0	0	4	1	0	0	2	1	0	0	10	1	0	0
Nigeria	11	1	0	0	5	1	0	0	5	1	0	0	0	1	0	0	6	1	0	0
Rwanda	20	1	0	0	4	1	0	0	4	1	0	0	2	1	0	0	4	1	0	0
Senegal	20	1	0	0	5	1	0	0	3	1	0	0	2	1	0	0	10	1	0	0
Seychelles	25	1	0	0	5	1	0	0	5	1	0	0	2.5	1	0	0	5	1	0	0
Sierra Leone	99	1	15	15	99	1	40	40	99	1	40	40	99	1	10	10	99	1	12.5	12.5
South Africa	20	1	0	0	99	1	40	20	3	1	0	0	3	1	0	0	6	1	0	0
Tanzania	20	1	0	0	99	1	25	25	99	1	25	25	99	1	37.5	37.5	99	1	25	25
Togo	20	1	0	0	5	1	0	0	4	1	0	0	2	1	0	0	10	1	0	0
Tunisia	20	1	0	0	7	1	0	0	5	1	0	0	3	1	0	0	5	1	0	0
Uganda	20	1	0	0	99	1	30	30	99	1	30	30	99	1	40	40	99	1	20	20
Zimbabwe	20	1	0	0	99	1	10	10	99	1	20	20	4	1	0	0	99	1	10	10

Note: This table presents for each country the different parameters for the determination of the depreciation charges. These include, for each type of asset, the depreciation period and the depreciation rate, which can be linear (declining balance=1) or on (declining balance>1). In addition, a linear duration of 99 is entered for assets for which no time limit is imposed or specified.

Source: Different countries general tax codes, Ernst and Young, Deloitte, KPMG, and PWC tax guides for 2020.

Appendix 2: Incentives conditions, and sources

Country	Conditions for tax incentives	Source Link	Last access date
Algeria	Sector condition	http://www.droit-afrique.com/uploads/Algerie-Loi-2016-09-promotion-investissement.pdf	July, 14th 2022
Angola	Sector & Location conditions	https://www.dlapiperfrica.com/en/angola/insights/2018/new-private-investment-law.html	July, 14th 2022
Benin	Sector & Investment conditions	https://benindoingbusiness.bj/media/CODE-GENERAL-DES-IMPOTS-2019.pdf	July, 14th 2022
Botswana	Sector condition	https://www.gobotswana.com/incentives-investors	July, 14th 2022
Burkina Faso	Sector & Investment conditions	https://www.impots.gov.bf/fileadmin/user_upload/storage/fichiers/Loi-058-portant-CODE-GENERAL-DES-IMPOTS-final.pdf	July, 14th 2022
Burundi	Employment condition	https://www.eac.int/finacial/eac-tax-matrices/income-tax-corporates	July, 14th 2022
Cabo Verde	Sector condition	https://taxnews.ey.com/news/2020-1767-cape-verde-amends-certain-tax-regimes-and-introduces-country-by-country-reporting	July, 14th 2022
Cameroon	Employment & Investment conditions	http://www.droit-afrique.com/uploads/Cameroun-Loi-2013-04-investissement-privé-MAJ-2017.pdf	July, 14th 2022
Centrafrique	Sector condition	http://droit-afrique.com/upload/doc/rca/RCA-Charte-2001-des-investissements.pdf	July, 14th 2022
Chad	Sector condition	https://www.academia.edu/37805893/REPUBLIQUE_DU_TCHAD_Code_G%C3%A9n%C3%A9ral_des_imp%C3%B4ts	July, 14th 2022
Comoros	Investment & Employment & Location conditions	http://www.droit-afrique.com/uploads/Comores-Code-2020-investissements.pdf	July, 14th 2022
Congo	Sector condition	http://droit-afrique.com/upload/doc/congo/Congo-Loi-2003-06-Charte-investissements.pdf	July, 14th 2022
Congo RDC	Size & Location conditions	http://droit-afrique.com/upload/doc/rdc/RDC-Code-2002-des-investissements.pdf https://legalrdc.com/wp-content/uploads/2019/12/Ordonnance-loi_69009_impots_sur_les_revenus.pdf	July, 14th 2022
Côte d'Ivoire	Size & Location & Investment & Sector conditions	http://www.tourisme.gov.ci/uploads/Ordonnance-2018-646-du-01-08-2018code-investissement.pdf.pdf	July, 14th 2022
Djibouti	Sector & Investment & Employment conditions	http://admin.theiguides.org/Media/Documents/code%20g%C3%A9n%C3%A9ral%20des%20impots_4.pdf	July, 14th 2022
Egypt	Location condition	https://investmentpolicy.unctad.org/investment-laws/laws/167/egypt-investment-law	July, 14th 2022
Eswatini	Sector condition	https://www.state.gov/reports/2020-investment-dimite-statements/eswatini/ https://investeswatini.org.sz/incentives/	July, 14th 2022
Ethiopia	Sector condition	https://chilot.me/wp-content/uploads/2013/01/investment-regulation-no-270-2012.pdf	July, 14th 2022
Gabon	Investment condition	http://droit-afrique.com/upload/doc/gabon/Gabon-Charte-investissements-1998.pdf http://droit-afrique.com/upload/doc/gabon/Gabon-Loi-2005-16-promotion-PME-PMI.pdf	July, 14th 2022
Gambia	Sector and size conditions	https://en.unesco.org/creativity/sites/creativity/files/qpr/giena_act_2015.pdf	July, 14th 2022
Ghana	Sector condition	http://images.mofcom.gov.cn/gh/accessory/201212/1354895014005.pdf	July, 14th 2022
Guinea	Sector condition	http://www.droit-afrique.com/uploads/Guinee-Code-2015-des-investissements.pdf	July, 14th 2022
Kenya	Sector condition	https://eakenya.or.ke/download/tax-incentives-and-exemption-regime-in-kenya-is-it-working/	July, 14th 2022
Lesotho	N.A	https://www.state.gov/reports/2019-investment-dimite-statements/lesotho/	July, 14th 2022
Liberia	Sector condition	https://lr.usembassy.gov/wp-content/uploads/sites/53/2017_General-Business-Law-of-Liberia.pdf	July, 14th 2022
Madagascar	Sector condition	https://web.archive.org/web/20211206164938/https://taxsummaries.pwc.com/madagascar/corporate/tax-credits-and-incentives	July, 14th 2022
Mali	Sector & investment conditions	http://www.droit-afrique.com/upload/doc/mali/Mali-LE-2012-annexe-fiscale.pdf	July, 14th 2022
Mauritania	Investment condition	http://www.droit-afrique.com/uploads/Mauritanie-Code-investissements-2012-MAJ-2016.pdf	July, 14th 2022
Mauritius	N.A	https://attorneygeneral.govmu.org/Documents/Laws%20of%20Mauritius/A-2%20Acts/In/Investment%20Promotion%20Act-19.pdf	July, 14th 2022
Morocco	Sector condition	https://assets.ey.com/content/dam/ey-sites/ey-com/en_am/tax-and-law/ey-worldwide-corporate-tax-guide-20-july-2020.pdf	July, 14th 2022
Mozambique	Sector & location conditions	http://invest.apix.gov.mz/wp-content/uploads/sites/4/2019/07/KPMG-Fiscal-Guide.pdf http://invest.apix.gov.mz/wp-content/uploads/sites/4/2019/08/Investment-Law-3-93.pdf	July, 14th 2022
Namibia	Sector condition	https://assets.kpmg/content/dam/kpmg/na/pdf/2019/2019-namibia-tax-card.pdf	July, 14th 2022
Niger	Sector & Investment conditions	http://droit-afrique.com/upload/doc/niger/Niger-Code-2014-investissements.pdf	July, 14th 2022
Nigeria	Sector condition	https://web.archive.org/web/20201003231053/https://taxsummaries.pwc.com/nigeria/corporate/tax-credits-and-incentives	July, 14th 2022
Rwanda	N.A	http://droit-afrique.com/upload/doc/rwanda/Rwanda-Loi-2005-26-investissements.pdf	July, 14th 2022
Senegal	Investment & sector conditions	http://droit-afrique.com/upload/doc/senegal/Senegal-Code-2004-des-investissements-MAJ-2012.pdf https://investinsenegal.com/IMG/pdf/cgi2013-3.pdf	July, 14th 2022
Seychelles	N.A	http://www.seychellestradeportal.gov.sc/sites/default/files/Seychelles%20Investment%20Act%2C%202010.pdf	July, 14th 2022
Sierra Leone	N.A	https://www.nra.gov.sl/sites/default/files/Final%20Magazine%20MRP%2029-5-19.pdf	July, 14th 2022
South Africa	N.A	https://investmentpolicy.unctad.org/investment-laws/laws/157/south-africa-investment-act#:~:text=To%20provide%20for%20the%20legislative.provide%20for%20matters%20connected%20herewith	July, 14th 2022
Tanzania	N.A	https://tanzania.eregulations.org/media/INVESTMENT%20ACT.pdf	July, 14th 2022
Togo	Sector & Investment conditions	https://commerce.gov.tg/wp-content/uploads/2020/09/CODE-DES-INVEST-TOGO-compressed-compressed-compressed.pdf	July, 14th 2022
Tunisia	N.A	https://www.droit-afrique.com/uploads/Tunisie-Loi-2016-71-investissement.pdf	July, 14th 2022
Uganda	Sector condition	https://web.archive.org/web/20220520112402/https://taxsummaries.pwc.com/uganda/corporate/tax-credits-and-incentives https://www.ura.go.ug/openFile.do?path=/webupload/upload/download//staticContent//TOPM-ENU//1126//9632_A_TAX_INCENTIVES_GUIDE_FOR_INVESTORS_IN_UGANDA_October_2019.pdf	July, 14th 2022
Zimbabwe	N.A	https://web.archive.org/web/20210801171757/https://taxsummaries.pwc.com/zimbabwe/corporate/tax-credits-and-incentives	July, 14th 2022

Source: Authors compilation using Ernst and Young, Deloitte, KPMG, and PWC tax guides for 2020, and countries' investment codes.

Appendix 3: Assets depreciation, Employer Lump-Sum Contribution, and custom duties

Year		1	2	3	4	5
DEPRECIATION						
Buildings	USD	124 800				
Linear duration	Years	20				
Degrressive coefficient	Coefficient	1				
Remaining years		20	19	18	17	16
Depreciable balance	USD	124 800	118 560	112 320	106 080	99 840
Linear rate	%	5	5.3	5.6	5.9	6.3
Degrressive rate	%	5	5.3	5.6	5.9	6.3
Depreciation costs	USD	6 240	6 240	6 240	6 240	6 240
Equipment	USD	187 200				
Linear duration	Years	5				
Degrressive coefficient	Coefficient	1				
Remaining years		5	4	3	2	1
Depreciable balance	USD	187 200	149 760	112 320	74 880	37 440
Linear rate	%	20	25	33.3	50	100
Degrressive rate	%	20	25	33.3	50	100
Depreciation costs	USD	37 440	37 440	37 440	37 440	37 440
Trucks	USD	15 600				
Linear duration	Years	5				
Degrressive coefficient	Coefficient	1				
Remaining years		5	4	3	2	1
Depreciable balance	USD	15 600	12 480	9 360	6 240	3 120
Linear rate	%	20	25	33.3	50	100
Degrressive rate	%	20	25	33.3	50	100
Depreciation costs	USD	3 120	3 120	3 120	3 120	3 120
Computers	USD	15 600				
Linear duration	Years	3				
Degrressive coefficient	Coefficient	1				
Remaining years		3	2	1	0	0
Depreciable balance	USD	15 600	10 400	5 200	0	0
Linear rate	%	33.3	50	100	0	0
Degrressive rate	%	33.3	50	100	0	0
Depreciation costs	USD	5 200	5 200	5 200	0	0
Office equipment	USD	15 600				
Linear duration	Years	10				
Degrressive coefficient	Coefficient	1				
Remaining years		10	9	8	7	6
Depreciable balance	USD	15 600	14 040	12 480	10 920	9 360
Linear rate	%	10	11.1	12.5	14.3	16.7
Degrressive rate	%	10	11.1	12.5	14.3	16.7
Depreciation costs	USD	1 560	1 560	1 560	1 560	1 560
CUSTOM DUTIES						
CIF value of imported goods (Trucks+Equipments)	USD	202 800	202 800	202 800	202 800	202 800
Rate	%CIF value	0	0	0	0	0
Custom duties	USD	0	0	0	0	0
EMPLOYER LUMP-SUM CONTRIBUTION (ELC)						
Total salaries	USD	209 040	209 040	209 040	209 040	209 040
Rate	%salaries	0	0	0	0	0
ELC	USD	0	0	0	0	0

Source: Authors' calculation.

Appendix 4: Technical appendix for the AETR computation for Nigeria– CIT exemption

Year	Pre-Tax IRR: 17 percent (I)					Pre-Tax IRR: 37 percent (II)					Variation (I-II)			
	1	2	3	4	5	1	2	3	4	5				
ACCOUNTING PROFIT														
Sales (1)	USD	2,100,000	2,100,000	2,100,000	2,100,000	2,100,000	2,175,000	2,175,000	2,175,000	2,175,000	2,175,000			
Cost of goods sold (2)	USD	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000			
Administrative expenses (3)	USD	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000			
Advertising expenses (4)	USD	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000			
Machinery repair expenses (5)	USD	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000			
Salaries (6)	USD	134,000	134,000	134,000	134,000	134,000	134,000	134,000	134,000	134,000	134,000			
ELC (7)	USD	0	0	0	0	0	0	0	0	0	0			
Custom Duties (8)	USD	0	0	0	0	0	0	0	0	0	0			
Interest expenses (9)	USD	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000			
Depreciations (10)	USD	79,500	44,575	26,326	16,901	15,795	79,500	44,575	26,326	16,901	15,795			
Accounting profit: (1)-[(2)+(3)+...+(10)]	USD	78,500	113,425	131,674	141,099	142,205	153,500	188,425	206,674	216,099	217,205			
CIT BASE														
Accounting profit	USD	78,500	113,425	131,674	141,099	142,205	153,500	188,425	206,674	216,099	217,205			
Tax credit	USD	0	0	0	0	0	0	0	0	0	0			
CIT Base	USD	78,500	113,425	131,674	141,099	142,205	153,500	188,425	206,674	216,099	217,205			
CIT														
CIT Base	USD	78,500	113,425	131,674	141,099	142,205	153,500	188,425	206,674	216,099	217,205			
General tax code rate	% of CIT base	30	30	30	30	30	30	30	30	30	30			
Investment code rate (5 years complete CIT exemption)	% of CIT base	0	0	0	0	0	0	0	0	0	0			
CIT investment code	USD	0	0	0	0	0	0	0	0	0	0			
MIT														
Sales	USD	2,100,000	2,100,000	2,100,000	2,100,000	2,100,000	2,175,000	2,175,000	2,175,000	2,175,000	2,175,000			
Rate	% of Sales	1	1	1	1	1	1	1	1	1	1			
MIT	USD	10,500	10,500	10,500	10,500	10,500	10,875	10,875	10,875	10,875	10,875			
CIT/MIT														
Maximum (CIT, MIT)	USD	10,500	10,500	10,500	10,500	10,500	10,875	10,875	10,875	10,875	10,875			
Discount factor (with a discount rate of 8%) (f)		1	1	1	1	1	1	1	1	1	1			
TAX PAYMENTS														
Current amounts (c)														
ELC	USD	0	0	0	0	0	0	0	0	0	0			
CIT/MIT	USD	10,500	10,500	10,500	10,500	10,500	10,875	10,875	10,875	10,875	10,875			
Custom duties	USD	0	0	0	0	0	0	0	0	0	0			
Total	USD	10,500	10,500	10,500	10,500	10,500	10,875	10,875	10,875	10,875	10,875			
Discounted amount (c)*(f)														
ELC	USD	0	0	0	0	0	0	0	0	0	0			
CIT/MIT	USD	10,500	9,722	9,002	8,335	7,718	10,875	10,069	9,324	8,633	7,993			
Custom duties	USD	0	0	0	0	0	0	0	0	0	0			
Total (T)	USD	10,500	9,722	9,002	8,335	7,718	45,277	10,875	10,069	9,324	8,633	7,993	46,894	3.6%
PRE-TAX CASH FLOWS (PTCF)														
Current amount: (1)-[(2)+(3)+...+(9)]	USD	158,000	158,000	158,000	158,000	158,000	Total	233,000	233,000	233,000	233,000	233,000	Total	Variation
Discounted amount (DPTCF)	USD	158,000	146,296	135,460	125,425	116,135	681,316	233,000	215,741	199,760	184,963	171,262	1,004,726	47.5%
AVERAGE EFFECTIVE TAX RATE (AETR)														
T/DPTCF							6.6%						4.7%	

Appendix 5: Technical appendix for the AETR computation for Nigeria– 100 percent tax credit with a deduction cap of 50 percent

Year	Pre-Tax IRR: 17 percent (I)					Pre-Tax IRR: 37 percent (II)					Variation (I-II)			
	1	2	3	4	5	1	2	3	4	5				
TAX CREDIT														
Investment	USD	290,000	290,000	290,000	290,000	290,000	290,000	290,000	290,000	290,000				
Rate	% of investment	100				100								
Limitation	% of accounting profit	50												
Duration	Years	5												
Remaining tax credit periods	Years	5	4	3	2	1	5	4	3	2	1			
Tax credit base	USD	290,000	250,750	194,038	128,201	57,651	290,000	213,250	119,038	15,701	0			
Tax credit amount	USD	39,250	56,713	65,837	70,550	57,651	76,750	94,213	103,337	15,701	0			
ACCOUNTING PROFIT														
Sales (1)	USD	2,100,000	2,100,000	2,100,000	2,100,000	2,100,000	2,175,000	2,175,000	2,175,000	2,175,000	2,175,000			
Cost of goods sold (2)	USD	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000			
Administrative expenses (3)	USD	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000			
Advertising expenses (4)	USD	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000			
Machinery repair expenses (5)	USD	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000			
Salaries (6)	USD	134,000	134,000	134,000	134,000	134,000	134,000	134,000	134,000	134,000	134,000			
ELC (7)	USD	0	0	0	0	0	0	0	0	0	0			
Custom Duties (8)	USD	0	0	0	0	0	0	0	0	0	0			
Interest expenses (9)	USD	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000			
Depreciations (10)	USD	79,500	44,575	26,326	16,901	15,795	79,500	44,575	26,326	16,901	15,795			
Accounting profit: (1)-[(2)+(3)+...+(10)]	USD	78,500	113,425	131,674	141,099	142,205	153,500	188,425	206,674	216,099	217,205			
CIT BASE														
Accounting profit	USD	78,500	113,425	131,674	141,099	142,205	153,500	188,425	206,674	216,099	217,205			
Tax credit	USD	39,250	56,713	65,837	70,550	57,651	76,750	94,213	103,337	15,701	0			
CIT Base	USD	39,250	56,713	65,837	70,550	84,554	76,750	94,213	103,337	200,399	217,205			
CIT														
CIT Base	USD	39,250	56,713	65,837	70,550	84,554	76,750	94,213	103,337	200,399	217,205			
General tax code rate	% of CIT base	30	30	30	30	30	30	30	30	30	30			
Investment code rate	% of CIT base	30	30	30	30	30	30	30	30	30	30			
CIT investment code	USD	11,775	17,014	19,751	21,165	25,366	23,025	28,264	31,001	60,120	65,161			
MIT														
Sales	USD	2,100,000	2,100,000	2,100,000	2,100,000	2,100,000	2,175,000	2,175,000	2,175,000	2,175,000	2,175,000			
Rate	% of Sales	1	1	1	1	1	1	1	1	1	1			
MIT	USD	10,500	10,500	10,500	10,500	10,500	10,875	10,875	10,875	10,875	10,875			
CIT/MIT														
Maximum (CIT, MIT)	USD	11,775	17,014	19,751	21,165	25,366	23,025	28,264	31,001	60,120	65,161			
Discount factor (with a discount rate of 8%) (f)		1	1	1	1	1	1	1	1	1	1			
TAX PAYMENTS														
Current amounts (e)														
ELC	USD	0	0	0	0	0	0	0	0	0	0			
CIT/MIT	USD	11,775	17,014	19,751	21,165	25,366	23,025	28,264	31,001	60,120	65,161			
Custom duties	USD	0	0	0	0	0	0	0	0	0	0			
Total	USD	11,775	17,014	19,751	21,165	25,366	23,025	28,264	31,001	60,120	65,161			
Discounted amount (e)*(f)														
ELC	USD	0	0	0	0	0	0	0	0	0	0			
CIT/MIT	USD	11,775	15,753	16,933	16,801	18,645	23,025	26,170	26,578	47,725	47,896			
Custom duties	USD	0	0	0	0	0	0	0	0	0	0			
Total (T)	USD	11,775	15,753	16,933	16,801	18,645	79,908	23,025	26,170	26,578	47,725	47,896	171,394	114.5%
PRE-TAX CASH FLOWS (PTCF)														
Current amount: (1)-[(2)+(3)+...+(9)]	USD	158,000	158,000	158,000	158,000	158,000	Total 233,000	233,000	233,000	233,000	233,000	Total 233,000	Variation	
Discounted amount (DPTCF)	USD	158,000	146,296	135,460	125,425	116,135	681,316	233,000	215,741	199,760	184,963	171,262	1,004,726	47.5%
AVERAGE EFFECTIVE TAX RATE (AETR)														
T/DPTCF							11.7%						17.1%	

