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Do thin capitalization rules crowd out multinational firms in Africa? Looking towards efficiency in revenue mobilization

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Abstract

This study investigates whether the implementation of the thin capitalization rules (TCRs) in Africa could jeopardize its already insignificant attractiveness and assess the impact of tax administration efficiency in revenue mobilization. Analyzes are carried out through the two-step system GMM, using data from 33 African countries between 2005 and 2018. The study finds that in Africa, the TCRs have a deterrent effect on multinationals' decision to set up. The study also found that local tax administrations' level of efficiency in revenue mobilization cushioned the impact of TCRs on FDI inflows on average in the sample.

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1. Introduction

Studies for the economic transformation of Africa have resulted in solutions that raise the issue of their financing. For several decades, African economies have sought the attractiveness of multinational corporations (MNCs) capital. Strategies deployed for this purpose were inspired by the recommendations of studies arguing that small economies should avoid taxing foreign investors incomes to induce them to settle (Diamond and Mirrlees, 1971) and that there is an inverse relationship between the tax rate and the attractiveness of foreign capital (Hines, 1999; Gropp, 2000; Bénassy-Quéré, 2000). Yet, despite the tax facilities offered to MNCs, since 1970, Africa remains the least attractive area in the world. In 2018, Africa accounted for 3.5% of the total world flows, against 11.31% and 49.45% for America and Asia's developing economies, respectively (UNCTAD, 2019).

Africa has mainly attracted MNCs capital in natural resources (Rodrik, 2016). MNCs have unfortunately benefited from loopholes in tax systems and governments difficulties in controlling and applying the arm's length principle, to implement sophisticated international strategies designed to erode the tax base and drain profits to jurisdictions that impose lower or no taxes (UNDP, 2017). The result is substantial tax evasion and capital flight, which has caused Africa to lose Usd 1.8 trillion since 1970 (Ndikumana, 2017), and which continues to lose tens of billions of dollars every year (Solheim, 2016); more than 2% of African GDP (Cobham and Janský, 2018).

Considering that multinationals capital flows arrive in Africa like a stream and leave like a river that will be thrown into the sea, the issue of attractiveness has joined that of profit shifts to form a dilemma around the tax system. Since national tax provisions deduct interest to determine the taxable profit base, one of the many tricks is for MNCs to restrict equity to a minimum and finance much more by borrowing from subsidiaries or other related parties located in tax havens (Shay, 2017; Calder, 2017). Facing concerns about tax evasion, twelve[1] African countries adopted from the second half of the 1990s, the thin capitalization rules (TCRs), limiting the deductibility of interest on the global debt or that of the related parties to a specific equity ratio. To the best of my knowledge, little attention has been given to whether this anti-tax avoidance provision compromises Africa's attractiveness which is already weak, and whether local institutions are strong enough to make this provision effective.

Several factors suggest that African states are not strong enough to implement a TCRs policy effectively. First, apart from Namibia, tax revenues have averaged less than 16% of GDP (UNECA, 2019), while illicit outflows have exceeded the 40% of total trade in most African countries (GFI, 2019). Local tax administration agents' lack of expertise on international tax techniques and their low remuneration have allowed tax evasion to thrive. Thus, the falsification of commercial transactions and corruption contribute to 65% to the illicit capital outflows from Africa (Baker et al., 2014). Second, there has recently been a great deal of litigation evidence in Africa (Nigeria, Uganda, Equatorial Guinea, Namibia) between governments and MNCs involving fiscal issues. Then, one could wonder how economies that have a screaming need for capital may have forgotten to collect revenue from MNCs for decades. It is still because of laxity in applying the provisions that the transfer pricing provisions have been applied in

[1] South Africa, Ghana, Kenya, Rwanda, Zimbabwe, Mozambique, Cameroon, Uganda, DRC, Guinea, Egypt, Zambia.

Tanzania and the Democratic Republic of Congo, 10 and 13 years[2], respectively, after their adoption (ECA and al., 2017; EY, 2020). Thirdly, since 1960 African countries have signed 852 double taxation agreements (DTAs), including only 173 within African countries (UNCTD, 2019). DTAs provide MNCs with substantial tax reliefs on royalties, interest, profits and technical services. The countries benefiting from DTAs have been the source of 75.1% of FDI inflows into Africa over the past decade (IMF, 2020). One of the shortcomings of African tax systems is to allow firms whose countries have not signed DTAs to benefit from the advantages which result from this by registering as a subsidiary of companies located in countries which have ratified DTAs. So, African countries are characterized by institutional weaknesses and an asymmetry of skills and resources between the MNCs and local tax administration officials (UNDP, 2017).

This study aims to analyze the effect of TCRs on MNCs' investment decisions in Africa, paying particular attention to local administration efficiency in revenue mobilization.

This paper is organized into five sections. The second section offers a synthetic review of the empirical literature. The third section provides an overview of the methodological approach, while the fourth presents the results and the last concludes.

2. The tax policy-MNCs location nexus*: A brief review*

In the European Union, Smith (1999) shows that tax harmonization negatively impacts MNCs' location. In contrast, Mitchell (2002) argues that it is instead a tax competition because it involves transferring capital to countries with low tax rates. In some cases, there is an inverse relationship between the harvest rate and MNCs' investment decisions (Hiness, 1999; Gropp, 2000; Bénassy-Quéré, 2000; Desai, 2001; Hirtman, 1984). In many other cases, there is no significant effect (Cassou, 1997; Jun, 1994; Devereux and Freeman, 1995; Pain and young, 1996; Bénassy-Quéré et al., 2005).

Hassett and Hubbard (1997) focus on the complexity of the tax system. Like Edmiston et al. (2003) and Muller and Voget (2012), they show a positive relationship between certainty, the simplicity of the tax system, and MNCs' location. Djankov et al. (2010) find no significant effect, while Lawless (2013) argues that the impact is feeble. Considering the economic zone, Simmons (2003) shows a substantial relationship in developed countries, and Gordon and Nistor (2012) argue that MNCs are more tax-sensitive in emerging economies. Thus, the arrangements for attracting foreign investment are more effective than general ones (Haufler and Runkel, 2008). Sweson (2001) finds that the effect differs according to the sector coveted by MNCs. In the primary industry, the elasticity is zero, and it is -2 in manufacturing and -3 in services (Stowhase, 2003).

Recently, Buettner et al. (2014) and Merlo et al. (2020) used micro-data to estimate TCRs' effect on German MNCs' investment decisions in OECD countries between 1996 and 2007. They show that the impact is harmful, especially in countries with a high tax level. Merlo et al. (2020) widen the sample to 172 countries from 2002 to 2012. They reach the same conclusion as Buettner et al.

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[2] Adopted in 2004 in the section 33 of the Income Tax Act (ITA), the arm's-length principle were applied in Tanzania from May 2014. The effective date of application of the transfer pricing provisions in DRC is January 01, 2015, while it was adopted by the Law n ° 004/2003 of March 13, 2003.

(2014); the impact of TCRs on deciding where to locate a foreign subsidiary is negative.

The findings of Buettner et al. (2014), and Merlo et al. (2020) are unlikely to provide reliable information on the impact of TCRs on FDI inflows into Africa. Indeed, data from the *Coordinated direct investment survey* (IMF, 2020) relating to the FDI flows that the states declared to have received from German multinationals show that the FDI from German multinationals in Africa is marginal. On average between 2009 and 2018, FDI inflows from German MNCs represented 0.57% and 1.59% of the total FDI inflows recorded in North Africa and sub-Saharan Africa, respectively. In North Africa, FDI inflows from German MNCs experienced a growth trend with a maximum of 2.09% (of the total FDI inflows) in 2018. Conversely, these inflows decreased in SSA, ranging from 2.65% in 2009 to 1.17% in 2018. As the authors themselves have pointed out, the studies by Buettner et al. (2014), and Merlo et al. (2020) are mainly adapted to the contexts of developed countries (European Union and the United States) and emerging economies (Russia and China). Due to a lack of data, these studies only considered South Africa among the African countries which have implemented the TCRs. Yet, the African context is marked by poorly trained tax administrations with low-paid agents and therefore susceptible to corruption. The formulations of TCRs in Africa are specially oriented towards mining and placed under government control. Usually, the government tends to modify the regulations according to the shocks' amplitude produced by the fluctuations of prices on the State's revenues. Therefore, it is plausible to consider that compared to developed countries, the degree of enforcement in Africa can make a significant difference in the impact of TCRs on the decision of MNCs to settle.

So far, a question remains unanswered. Is the impact of TCRs on FDI inflows depend on the tax administration's efficiency in revenues mobilization? That is the gap that this study attempts to fill.

3. Analytical Framework

The basic model used to assess the impact of TCRs on decisions to locate MNCs is proposed by Feulefack and Ngassam (2020) which analyzes the effect of the interaction between natural resources and institutions on foreign direct investment inflows. The relationship to be estimated appears as follows:

$$Fdi_{i,t} = \tau_0 + \tau_1 Fdi_{i,t-1} + \tau_2 SHT_{i,t} + \tau_3 EffcyRM_{i,t} + \tau_4 SHT * EffcyRM_{i,t} + \tau_5 Minerent_{i,t} + \tau_6 GDPcgr_{i,t} + \tau_7 Human_{i,t} + \mu_i + \varepsilon_{i,t} \qquad (1)$$

Where μ_i designates the fixed effects and $\varepsilon_{i,t}$ is the error term. FDI inflows approximate the location decision of the MNCs. The basic model is modified by introducing variables measuring the thin capitalization rules (SHT), the administration's efficiency in revenue mobilization (EffcyRM), and an interaction term between these latter. The analysis assumes that these FDI inflows exhibit a positive relationship with mineral rents (Minerent), human capital (*Human*), and the market size measured by the growth rate of GDP per capita (*GDPcgr*). The thin capitalization rules (*TCRules*) are expected to have a negative effect cushioned by the institutional environment.

The total leverage ratio (*SHT: Safe-haven threshold*), which reflects the maximum value of the total debt ratio to assets measures the thin capitalization regime stringency. As performed by Blouin et al. (2014) and Merlo et al. (2020), the total leverage ratio is given by $SHT = \frac{\varphi}{1+\varphi}$ where φ is the maximum total debt-to-equity ratio. The maximum total debt-to-equity ratio is 1.5 in Cameroon, Guinea and Uganda. In Mozambique, the maximum total debt-to-equity ratio is 2, while it is 3 in DRC, in Ghana, Kenya, Zambia, Zimbabwe and 4 in Rwanda (Deloitte, 2019). The maximum debt-to-equity ratio in Ghana was initially of 2 before being adjusted to 3 in 2016. In Uganda, TCRs were introduced in 2013 with a debt-to-equity ratio of 1.5. In 2014, the country moved the threshold from 2 to 1, then from 1 to 1.5 in 2016. The debt-to-equity ratio threshold has remained constant in other countries since implementing the TCRs (Deloitte, 2019).

Table I. *Descriptive statistics*

Variables	Mean	S.D.	Description and data source
Fdi	5.861	2.535	*Foreign direct investment inflows, from UNCTAD (2020)*
SHT	0.129	0.274	*Thin capitalization rules, computing by the author*
Effcyrm	1.209	0.155	*Efficiency in revenue mobilization, World Development indicator (World Bank., 2020)*
Minerent	2.333	0.768	*Mineral rents (%GDP), (World Bank, 2020)*
GDPcgr	1.110	1.379	*Market size approximated by per capita GDP growth rate, (World Bank., 2020)*
Human	0.448	0.061	*Human capital measured by the human development index, UNDP (2020)*

Note: All the variables are expressed in logarithms

Data availability on efficiency in revenue mobilization restricts the sample to 33 countries from 2005 to 2018. The individual dimension being more significant than the temporal dimension, the system-Generalized Method of Moment (GMM) appears indicated for the estimates (Roodman, 2009). The use of GDP per capita growth rate as an explanatory variable proxy for market size can lead to simultaneity. Just as per capita GDP growth can impact the level of FDI inflows, it is plausible that FDI inflows generate growth in return. This relationship is, in fact, widely documented. Thus, to overcome the reverse causality bias, and at the same time, capture the dynamics of the relation, a one-period lag value of the dependent variable is introduced among the explanatory variables. As mentioned above, the estimate proceeds through the two-steps system Generalized Method of Moments. The system GMM proposed by Arellano & Bover (1995) and Blundell & Bond (1998) is particularly appropriate to overcome the endogeneity bias. This method also controls for simultaneity, heteroscedasticity and autocorrelation biases. Moreover, System GMM prevents measurement errors in the data, omitted variables bias, and unobserved panel heterogeneity.

The variables measuring the TCRs, efficiency in revenue mobilization, the interaction term and, the first difference of mineral rent and human capital, are used as instruments in the estimates. The instruments are valid, and the estimated coefficients are robust. As Roodman (2009) indicated, the total number of instruments is less than the number of cross-countries, and the p-value associated with the Hansen instrument validity test is less than 0.6. Also, the estimates are carried out paying attention to the model's overall validity test, which requires that the p-value of the Fisher test be lower than 5%. Care is also given to the requirement of absence of serial autocorrelation, ensured when the p-value associated with AR (2) is higher than 5%. The results are compared with those provided by Ordinary Least Squares (OLS) and within-FE (FE) to assess the bias.

4. Empirical results

Buettner et al. (2014), and Merlo et al. (2020) showed that in developed countries and emerging markets characterized by strong institutions, the implementation of TCRs has negatively impacted FDI inflows. The institutional weakness that characterizes African countries with corruption and laxity in the enforcement of legal provisions could suggest that TCRs would not significantly impact FDI inflows. Yet, the results reported in Table 2 show the opposite. From the outset, the bivariate regression specification (column (1)) where the TCRs are considered the only factor explaining the MNCs' decision to invest abroad show that the TCRs have an adverse effect. In this regression, TCRs and FDI inflows exhibit an inelastic relationship.

Table II. Impact of TCRs on FDI inflows, controlling efficiency in revenue mobilization

Dependent variable: *Foreign Direct Investment inflows*	*Two-steps System GMM*					
	(1)	(2)	(3)	(4)	(5)	(6)
Thin capitalization rules (SHT)	**-0.661*** **	**-0.433** **	**-4.261*** **	**-6.695*** **	**-4.816*** **	**-6.454*** **
	(0.000)	**(0.029)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.001)**
Efficiency in revenue mobilization (EffcyRm)		-1.096***	-1.099***	-1.294***	-1.236***	-1.894***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.008)
SHT*Efficiency			2.964***	4.883***	3.405***	4.684***
			(0.002)	(0.000)	(0.001)	(0.003)
Minerals rent				0.352***	0.146*	0.156*
				(0.000)	(0.076)	(0.051)
Per capita GDP growth					0.278***	0.281***
					(0.000)	(0.000)
Human capital						0.988
						(0.512)
Lag1.Foreign Direct Investment	1.261***	1.828***	1.783***	1.731***	1.630***	1.808***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	429	429	429	429	429	429
Number of country	33	33	33	33	33	33
Number of Instruments	28	31	30	31	31	32
Fisher	3178.9***	814.14***	468.06***	621.3***	457.49***	411.2***
AR(2)	0.038	0.050	0.053	0.056	0.071	0.073
Hansen	0.358	0.593	0.523	0.479	0.331	0.314

*p-value in parentheses: ***p<0.01; **p < 0.05; *p < 0.1*

The robustness of this relationship is assessed by introducing, in turn, a set of control variables identified by previous work as essential to the attractiveness of FDI. Thus, going from column (2) to (6), the negative impact of TCRs on FDI inflows is confirmed, and these two variables now exhibit an elastic relationship (*column (3) to (6)*). Therefore, this result is consistent with the findings of Buettner et al. (2014) and Merlo et al. (2020) based on the case of German multinationals in developed and emerging economies.

The results show that the MNCs' decision to invest in Africa also depends on the administration's efficiency in revenues mobilization. MNCs' sensitivity is such that they reduce their investment claims by 1.894% following an increase in the tax administration's efficiency by 1%, at a 1% significance level, ceteris paribus. The usual mechanisms through which MNCs subtract a significant portion of their profits are based on local tax administrations' inefficiency. Sometimes, host countries' governments jump to demand an audit after several years, motivated by a drastic drop in state revenues. Such situations have led to litigation with MNCs in the extractive industry in Uganda, Zambia, Algeria, and Nigeria.

North (1990) argues that good rules (institutions) may not produce the desired effects if their enforcement is weak. The coefficient of the interaction term is positive and significant at a 1% level. The sign of the coefficient of the interaction term contrasts with that of the coefficient of the TCRs. Therefore, it appears that on average in the sample during the period studied, the level of efficiency in revenue mobilization reduced the negative impact that TCRs were supposed to exert on FDI inflows.

The estimates by the two-step system GMM are robust compared to those of the OLS and FE estimators.

Table III. *Analysis of the internal validity of the results*

Dependent variable: *Foreign Direct Investment inflows*	(1) Two-steps System GMM	(2) OLS	(3) Fixed-effect
Thin capitalization rules (SHT)	-6.454***	-0.436	-4.059**
	(0.001)	(0.819)	(0.037)
Efficiency in revenue mobilization (EffcyRM)	-1.894***	0.956***	1.167*
	(0.008)	(0.004)	(0.076)
SHT * EfficyRM	4.684***	0.469	3.530**
	(0.003)	(0.748)	(0.024)
Mineral rent	0.156*	0.128***	0.097
	(0.051)	(0.000)	(0.244)
Per capita GDP growth	0.281***	0.081**	0.043
	(0.000)	(0.014)	(0.115)
Human capital	0.988	1.396*	1.856
	(0.512)	(0.079)	(0.261)
Lag.(Foreign Direct Investment inflows)	1.808***		
	(0.000)		
Observations	429	462	462

*p-value in parentheses: ***p<0.01; **p < 0.05; *p < 0.1*

Regardless of the estimator considered, the impact of TCRs on FDI inflows is negative. It becomes significant at a 5% level when the model is estimated by the FE. When simultaneity and endogeneity biases are controlled and corrected through the system GMM estimator, TCRs' effect on FDI inflows becomes significant at a 1% level. Likewise, by remedying the simultaneity and endogeneity biases, the impact of efficiency in revenue mobilization becomes negative and significant at a 1% level.

Since the provisions relating to TCRs in Africa have been specifically enacted to regulate the extractive industry, TCRs' negative impact should mainly concern FDI into this industry. This negative effect could become even weaker and even disappear following a favourable trend of mineral prices or an infrastructural development that would reduce the costs of extraction exceptionally high on the continent. Conversely, the negative effect of TCRs could increase and consequently decrease the attractiveness of Africa. By anticipating the worst-case scenario, African countries should encourage FDI inflows into other activity sectors, particularly in the manufacturing industry.

Conclusion

Some African countries' decision to implement TCRs to stem the phenomenon of capital flight has raised fears that the attractiveness of the region will be compromised and doubts about the institutional capacity of the countries concerned to put into force such a disposition. This study finds that indeed, the implementation of TCRs induces a dissuasive effect on FDI inflows. Unfortunately, due to a lack of sectoral data on FDI, it was impossible to determine whether this adverse effect only affects investments directed towards the mining industry or is more pronounced in this sector. Indeed, the provisions relating to TCRs in Africa are explicitly focused on the mining sector. Besides, the success of the implementation of TCRs depends on the administration's effectiveness in mobilizing revenues.

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