

# Misallocation and Financial Constraints Among Firms in Africa

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January 19, 2022

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# Introduction

- Misallocation of resources across firms as source of TFP differences across countries
- In India and China, bigger firms have higher marginal products of inputs and are more productive so more resources should be allocated to them (Hsieh and Klenow 2009)
- In Africa, bigger firms have lower marginal products of factor inputs and therefore smaller firms are using less than optimal amounts of factor inputs (author's analysis)

# Research Question and Methods

## 1. Question

- What role do financial markets play in the resource misallocation across firms in Africa?

## 2. Methods

- Use the Hsieh and Klenow (HK) model to derive structural measures of distortions and empirically quantify the extent to which financial obstacles contribute to misallocation

## 3. Data

- Enterprise Survey Data for 12 African countries

# Production Function and Empirical Model

$$Y_{si} = A_{si} \left[ (1 - \mu_s)^{\frac{1}{\epsilon_m}} \left( \left( \frac{K_{si}}{\alpha_s} \right)^{\alpha_s} \left( \frac{L_{si}}{1 - \alpha_s} \right)^{1 - \alpha_s} \right)^{\frac{\epsilon_m - 1}{\epsilon_m}} + \mu_s^{\frac{1}{\epsilon_m}} M_{si}^{\frac{\epsilon_m - 1}{\epsilon_m}} \right]^{\frac{\epsilon_m}{\epsilon_m - 1}} \quad (1)$$

- Revenue  $P_{si}Y_{si}$ : firms' sales
- Capital  $K_{si}$ : value of all machinery, vehicles and equipment
- Labor  $L_{si}$ : total labor cost
- Intermediate inputs  $M_{si}$ : total spending on raw materials and intermediate inputs
- **Empirical method**: effects of various obstacles, ( $O_i$ ) on output distortions ( $\tau_y$ ) using the cross-section of all countries

$$\log(1 - \tau_{ycsi}) = \alpha_1 + \alpha_2 O_i + \alpha_3 X_i + \delta_s + \delta_c + \epsilon_i \quad (2)$$

- Obstacles: the extent to which different factors (access to infrastructure, transportation and financing; taxes; weak institutions) present an obstacle to the firm (from survey, self-reported)

**Table 1:** Regressions of output distortions on all obstacles

	Financing	Transportation	Labor Reg	Land	Tax	Corruption	Education
Obstacle	-0.15*** (0.05)	-0.03 (0.06)	0.18** (0.08)	-0.09 (0.06)	0.01 (0.05)	-0.11* (0.06)	-0.09 (0.07)
Size	1.74**** (0.23)	1.86**** (0.23)	1.90**** (0.23)	1.82**** (0.23)	1.84**** (0.24)	1.74**** (0.23)	1.72**** (0.24)
Obstacle × size	0.06* (0.03)	0.01 (0.04)	-0.03 (0.06)	0.05 (0.04)	0.03 (0.04)	0.09** (0.04)	0.12** (0.05)
Age	0.004 (0.003)	0.004 (0.003)	0.004 (0.003)	0.004 (0.003)	0.004 (0.003)	0.003 (0.003)	0.004 (0.003)
EPZ	-0.36* (0.19)	-0.36* (0.19)	-0.34* (0.19)	-0.36* (0.19)	-0.36* (0.19)	-0.39** (0.2)	-0.39** (0.2)
EPZ × size	-0.06 (0.13)	-0.05 (0.13)	-0.06 (0.13)	-0.05 (0.13)	-0.05 (0.13)	-0.03 (0.13)	-0.02 (0.13)
Observations	3126	3126	3126	3126	3126	3126	3126

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ , \*\*\*\*  $p < 0.001$

- Dependent variable:  $(1 - \tau_y)$  is measure of allocative efficiency. Output distortions  $\tau_y$  constrain the firms use of factor inputs
- EPZ=1 if firm is not in an export processing zone
- Access to financing obstacles significantly increase output distortions

Table 2: Output distortions and access to financing

	Mozambique	Senegal	Ghana	Madagascar	Nigeria	Zambia
Financing obstacle	-0.66**** (0.15)	-0.48** (0.19)	-0.36* (0.21)	0.49 (0.33)	0.15 (0.094)	-0.05 (0.19)
Size	1.66*** (0.56)	2.76*** (1.05)	0.83 (0.98)	1.04 (1.37)	1.3** (0.6)	1.71**** (0.29)
Financing obstacle × size	0.35**** (0.1)	0.33** (0.15)	0.12 (0.14)	-0.3* (0.15)	-0.11 (0.07)	0.07 (0.11)
EPZ	-0.32 (0.52)	0.66 (0.93)	-0.52 (0.86)	-1.44 (1.64)	-0.66 (0.47)	
EPZ × Size	0.05 (0.33)	-0.96* (0.57)	0.22 (0.52)	0.23 (0.68)	0.14 (0.32)	-0.13 (0.13)
Observations	336	244	268	164	884	279
Adjusted $R^2$	0.439	0.301	0.287	0.092	0.245	0.408

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ , \*\*\*\*  $p < 0.001$

- In Mozambique, Senegal and Ghana, financing constraints significantly increase output distortions

Table 3: Regressions of output distortions by firm size

	All	Small and Medium	Large
Financing constraint	-0.124**** (0.0226)	-0.121**** (0.0222)	0.152 (0.275)
Age	0.0169**** (0.00344)	0.0129**** (0.00346)	-0.00713 (0.0347)
EPZ	-0.617**** (0.0883)	-0.547**** (0.0879)	-0.533 (0.981)
Observations	3126	3013	113

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ , \*\*\*\*  $p < 0.001$

- Financing constraints are drivers of output distortions for small and medium enterprises only

# Discussion

- Financial constraints are non-negligible factors driving output misallocation in quite a few African countries
- These financial obstacles constrain smaller firms from growing and therefore they face even more distortions compared to bigger firms
- Bigger firms are able to overcome their financial obstacles more relative to smaller ones as they have higher revenues and therefore greater means of financing working capital
- Export processing zones are very favorable as there are significantly less distortions in those zones, even after controlling for size