

Labor Productivity in the Informal Sector: Necessity vs. Opportunity Firms

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Differences between opportunity and necessity firms within the informal sector have long been debated. This paper revisits this debate using a new dataset of informal firms in three African countries. Focusing on average productivity of labor, a measure of firm efficiency, we find that it is much higher for opportunity compared with necessity firms. However, this difference between necessity and opportunity firms holds only within the sample of manufacturing firms. For firms in the service sector, there is no such difference.

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1. Introduction

In an early contribution, Lewis (1954) argued that labor markets in many developing countries are highly segmented. In such a market, many workers are rationed out of the formal sector jobs and therefore forced to start a business in the informal or unregistered sector (necessity entrepreneurs). This view of the informal sector is broadly consistent with the low level of efficiency and wages that are typically associated with the informal sector (see, for example, La Porta and Shleifer, 2008). However, more recent work by, among others, Maloney (2004) and Yamada (1996), provides evidence that entry into the informal sector is by choice and an attempt to take advantage of business opportunities (opportunity entrepreneurs). A related question that has received less attention is precisely how different are necessity vs. opportunity firms. Does it matter whether entry into the informal sector is by choice or necessity? The present paper attempts to answer this question.

That the underlying motivation for starting a business (necessity vs. opportunity) could have an important effect on the structure and efficiency of informal businesses, is a natural starting point. After all, the dynamic role that the Schumpeterian (opportunity) entrepreneur plays in the growth of the private sector can hardly be ignored. A recent survey of informal firms in Ivory Coast, Madagascar and Mauritius (Enterprise Surveys, 2008), shows that roughly 62 percent of the surveyed firms are opportunity firms and the rest, necessity firms. Using these data, we look at how labor productivity, a measure of firm-efficiency, varies across necessity vs. opportunity informal firms. Our results show that opportunity firms are almost twice as efficient as necessity firms, even after controlling for various observables. However, this difference between necessity and opportunity firms is entirely due to manufacturing sector firms. In the service sector, the distinction between necessity and opportunity firms is irrelevant as far as labor productivity is concerned.

2. Data and Main Variables

The data we use comes from a survey of informal or unregistered firms in Madagascar, Ivory Coast and Mauritius. The survey was conducted by the World Bank's Enterprise Surveys in 2008-09. The sampled firms were randomly selected and include a mix of young and old, manufacturing and service, and with and without educated owners. The sample is roughly equally distributed across the three countries and also between manufacturing vs. service firms.¹

2.1 *Dependent variable*

The dependent variable is the average productivity of labor (henceforth, labor productivity). It is defined at the firm level and equals (log of) total sales in a regular month (in USD) divided by the total number of employees. The mean value of the variable is 4.1 and the standard deviation equals 1.6.

2.2 *Explanatory variables*

In one of the questions, firms were asked if the largest owner started or took over the business to take advantage of a business opportunity or because he/she could not find a satisfactory job elsewhere. We define our main explanatory variable, *Opportunity*, equal to 1 if the former reason (take advantage of business opportunity) were selected and 0 otherwise.² The mean value of *Opportunity* equals 0.617 and the standard deviation equals 0.487.

Remaining explanatory variables are motivated by existing studies and guard against possible omitted variable bias problem with the estimated relationship between *Opportunity* and labor productivity. In our main specification, we control for fixed effects for country, sector and the level of education of the largest owner (secondary, less than and higher than secondary education); the number of employees in a regular month (to capture possible diminishing returns to labor) and age of the firm

¹ The data and the survey methodology are available at www.enterprisesurveys.org.

² Firms were allowed to choose the residual category of "other" motivation for starting or taking over the business. This category was chosen by 11 firms (3.5 percent of the sample). We exclude these firms from the empirical analysis.

(to capture possible selection and learning related effects). Additional controls are discussed in the robustness section.

3. Estimation

All regression results discussed below use the Ordinary Least Squares estimation method with Huber-White robust standard errors. Results for the main specification are provided in Table 1. Without any other controls, the estimated coefficient value of *Opportunity* equals 0.606, significant at less than the 1% level (column 1, Table 1). That is, the average productivity of labor (without logs) for an opportunity firm is about 1.8 times the same for a necessity firm. Adding our main controls to the specification, the estimated coefficient value of *Opportunity* remains positive, statistically significant and economically large (columns 2-5). Even for the smallest coefficient value of *Opportunity* (column 3), average productivity of labor (without logs) for an opportunity firm is about 1.6 times the same for a necessity firm.

Regression results for the sample of manufacturing firms and service firms are provided in columns 6 to 9 of Table 1. These results clearly show that the opportunity vs. necessity firm distinction for labor productivity holds only for the manufacturing sector firms.

3.1 Robustness

Robustness results are provided in Table 2. Columns 1 to 6 contain results for the full sample, column 7 for the manufacturing firms and column 8 for service sector firms. Controls in the table include various firm characteristics, quality of the business environment and other variables, which could affect labor productivity and may also be correlated with the motivation for starting a business.

Column 1 shows results controlling for a dummy equal to 1 if the largest owner of the firm is a female and 0 otherwise (*Female*), and fixed effects for the ethnicity of the largest owner (African, Asian

and European and the residual category of all other ethnicities). In the next column, we add a dummy variable equal to 1 and 0 otherwise if the firm operates outside of household premises (*Outside*), number of owners of the firm and a dummy indicating if the largest owner is also the main decision maker. In column 3, we control for the number of hours a firm normally operates, a dummy indicating if a firm uses machinery in its production process, percentage of labor that is paid (vs. unpaid), proportion of labor made up by family members, and a dummy indicating labor absenteeism due to sickness of workers (*Sick*). In column 4 we include controls for access to finance and infrastructure services. These controls include dummy variables indicating if over the last year, a firm used electricity, water, external finance and whether it was credit constrained or not. A credit constrained firm is defined as one that wanted to borrow from external sources but did not apply for a loan because of complex application procedures, high interest rates, lack of collateral, unregistered business and other reasons. In column 5, we add controls for the overall quality of the business environment. These controls include a dummy indicating if a firm experienced a crime incident during the survey year and the severity of the reported obstacles on electricity, water, access to land, access to finance, crime, political instability and corruption (average value). Last, in column 6, we control for the seasonal nature of business as measured by the ratio of firm's sales in the busiest to the slowest month.

Table 2 shows that our main results easily survive all the robustness checks discussed above. The estimated coefficient value of *Opportunity* remains positive, economically large and statistically significant. Similarly, the distinction between manufacturing and service firms for the *Opportunity*-labor productivity link discussed above survives the robustness checks (columns 7 and 8, Table 2).

4. Conclusion

The paper uses a new dataset of informal or unregistered firms in three African countries to explore differences between opportunity and necessity firms. We find that labor productivity, a measure of firm

efficiency, is much higher for opportunity compared with necessity firms, a result largely driven by firms in the manufacturing sector. This difference cannot be easily explained by differences in observables such as firm-size and education level of the owner. It is possible that the more efficient agents self-select into opportunity entrepreneurs while the less efficient ones, into necessity entrepreneurs.

References

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Table 1: Base regressions (OLS)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable:			Full sample			Manufacturing firms		Service firms	
<i>Labor productivity</i>									
<i>Opportunity</i>	0.606*** [0.001]	0.514*** [0.003]	0.478*** [0.004]	0.499*** [0.003]	0.489*** [0.004]	0.955*** [0.000]	0.831*** [0.000]	0.173 [0.504]	-0.004 [0.989]
Manufacturing			-0.487*** [0.003]	-0.448*** [0.009]	-0.412** [0.019]				
Less than secondary educated				-0.389* [0.076]	-0.415* [0.062]		-1.037*** [0.001]		0.377 [0.220]
Secondary educated				-0.28 [0.229]	-0.298 [0.195]		-0.762** [0.026]		0.154 [0.589]
Employment (log)					-0.390* [0.086]		-0.682*** [0.005]		0.061 [0.884]
Age (log)					-0.048 [0.606]		0.094 [0.336]		-0.30* [0.078]
Country fixed effects	No	Yes	Yes	No	Yes	No	Yes	No	Yes
Observations	311	311	311	311	311	157	157	154	154
R-squared	0.035	0.177	0.200	0.208	0.219	0.097	0.351	0.003	0.158

Robust p values in brackets. Significance level denoted by *** (1%), ** (5%) and * (10%). All regressions run with a constant term (not shown). The sample in columns 6 and 7 consists of manufacturing firms and service firms in columns 8 and 9. Remaining columns (1 to 5) use the full sample.

Table 2: Robustness results

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Labor productivity</i>			Full sample				Manufacturing	Service
<i>Opportunity</i>	0.537***	0.534***	0.498***	0.517***	0.536***	0.560***	0.902***	0.124
	[0.002]	[0.004]	[0.010]	[0.008]	[0.007]	[0.001]	[0.000]	[0.659]
Manufacturing	-0.441**	-0.444**	-0.453*	-0.398	-0.357	-0.295		
	[0.014]	[0.013]	[0.064]	[0.114]	[0.169]	[0.172]		
Less than secondary educated	-0.406*	-0.382	-0.314	-0.338	-0.369	-0.371	-0.832**	0.166
	[0.066]	[0.119]	[0.191]	[0.192]	[0.161]	[0.155]	[0.012]	[0.688]
Secondary educated	-0.258	-0.239	-0.227	-0.207	-0.196	-0.182	-0.574*	0.132
	[0.260]	[0.357]	[0.368]	[0.445]	[0.487]	[0.481]	[0.065]	[0.747]
Employment (log)	-0.35	-0.358	-0.507**	-0.564**	-0.64***	-0.66***	-1.26***	-0.462
	[0.118]	[0.133]	[0.028]	[0.019]	[0.010]	[0.005]	[0.000]	[0.329]
Age (log)	-0.074	-0.072	0.003	0.026	0.02	0.032	0.161	-0.07
	[0.433]	[0.469]	[0.971]	[0.782]	[0.836]	[0.713]	[0.140]	[0.640]
<i>Female</i>	-0.214	-0.217	-0.037	-0.055	-0.049	-0.087	-0.221	0.216
	[0.235]	[0.221]	[0.819]	[0.735]	[0.768]	[0.557]	[0.260]	[0.429]
Ethnicity fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Outside</i>		-0.043	0.09	0.117	0.119	0.048	-0.109	0.222
		[0.844]	[0.701]	[0.604]	[0.603]	[0.787]	[0.584]	[0.523]
Number of owners		0.012	0.047	0.034	0.042	0.058	0.112	0.015
		[0.889]	[0.621]	[0.743]	[0.689]	[0.555]	[0.564]	[0.912]
Largest owner is main decision maker		-0.097	-0.249	-0.295	-0.328	-0.197	0.149	-0.429
		[0.760]	[0.428]	[0.355]	[0.315]	[0.531]	[0.832]	[0.321]
Hours of operation			0.001	0.001	0.002	0.001	0	0.001
			[0.807]	[0.892]	[0.762]	[0.920]	[0.937]	[0.879]
Firm uses machines			0.23	0.245	0.207	-0.005	-0.112	0.103
			[0.285]	[0.337]	[0.429]	[0.979]	[0.560]	[0.764]
Paid labor (% of total labor)			0.006***	0.007***	0.007***	0.007***	0.010***	0.004
			[0.007]	[0.005]	[0.006]	[0.007]	[0.002]	[0.255]
Family labor (proportion of total labor)			-0.184	-0.09	-0.085	0.055	0.354	-0.132
			[0.547]	[0.789]	[0.806]	[0.821]	[0.419]	[0.637]
<i>Sick</i>			-0.193	-0.13	-0.102	-0.089	0.002	-0.124
			[0.249]	[0.438]	[0.533]	[0.587]	[0.994]	[0.671]
Firm is credit constrained				-0.189	-0.211	-0.099	0.177	-0.289
				[0.337]	[0.289]	[0.570]	[0.455]	[0.282]
Firm uses external finance				0.028	0.042	0.147	-0.013	0.317
				[0.915]	[0.873]	[0.486]	[0.960]	[0.325]
Firm uses electricity				0.036	-0.001	0.001	0.178	-0.144
				[0.887]	[0.996]	[0.996]	[0.498]	[0.649]
Firm uses water				0.006	-0.028	-0.157	0.216	-0.67**
				[0.974]	[0.877]	[0.345]	[0.260]	[0.014]
Firm experienced one or more crime incident during the year					0.042	-0.014	-0.099	0.162
					[0.848]	[0.950]	[0.726]	[0.709]
Severity of other obstacles experienced by the firm					0.112	0.107	0.208	0.064
					[0.367]	[0.361]	[0.166]	[0.776]
Seasonality (log)						-0.216**	0.01	-0.40**
						[0.023]	[0.916]	[0.041]
Observations	302	298	280	273	270	258	129	129
R-squared	0.238	0.234	0.264	0.272	0.274	0.372	0.592	0.326

Robust p-values in brackets. Significance level denoted by *** (1%), ** (5%) and * (10%). All regressions run with a constant term (not shown). The sample in column 7 consists of manufacturing firms and service firms in column 8. Remaining columns (1 to 6) use the full sample.