3. The Informal Economy in Sub-Saharan Africa

The informal economy is a key component of most economies in sub-Saharan Africa, contributing between 25 and 65 percent of GDP and accounting for between 30 and 90 percent of total nonagricultural employment. While international experience indicates that the share of the informal economy declines as the level of development increases, most economies in sub-Saharan Africa are likely to have large informal sectors for many years to come, presenting both opportunities and challenges for policymakers.

The precise nature of the informal economy will differ from country to country. In this chapter the informal economy is defined as including (1) household enterprises that have some production at market value but are not registered;[1] and (2) more broadly, underground production, where productive activities are performed by registered firms but may be concealed from the authorities to avoid compliance with regulations or the payment of taxes, or are simply illegal. The informal economy as broadly defined exists to varying degrees in all countries, but the narrower definition of the informal economy is likely more prevalent in low-income countries. This chapter will henceforth refer to the narrower definition as the informal sector or household enterprises, and the broader definition as the informal economy.

On the positive side, the informal sector provides a welcome pool of jobs—this is particularly important in countries where the demographics are such that there is a large and growing working-age population that outstrips the pace of job creation in the formal sector. At the same time, however, the informal sector tends to contain relatively low productivity activities, so that a large informal sector perpetuates low productivity in the economy. Thus as the share of the formal sector increases—either by growth of formal sector entities or through the movement of informal sector entities into the formal sector—productivity gains are likely to materialize and the tax base is likely to expand, facilitating the revenue mobilization required to finance public services to sustain the development process.

The challenge for policymakers, therefore, is to create an economic environment in which the formal sector can thrive while creating opportunities for those working in the informal sector to maintain or improve their living standards.

To assess and identify the steps required to create such an environment, this chapter first examines the size of the informal economy in sub-Saharan Africa and how it compares to other regions. As there is considerable variation in the estimated sizes of the informal economies in sub-Saharan African countries, this chapter then seeks to identify factors that are associated with their relative sizes. It also investigates the interaction between informality and economic performance. Lastly, it draws on this analysis to identify policies that could promote the expansion of formal sector activity, and in the process unleash productivity and create jobs.

The main findings are as follows:

- The size of the informal economy is large in sub-Saharan Africa, especially in oil-exporting and fragile states, averaging 38 percent of GDP during 2010–14. The share of informal employment averages 60 percent of total nonagricultural employment.

- As household enterprises act as a safety net for the large and growing working-age population, authorities need to apply a balanced approach in their policies to formalize the informal sector, focusing on nurturing productivity gains rather than attempting to increase tax revenues from household enterprises. On the other hand, for firms that are above the tax threshold but choose to evade taxes either partially or fully, tax policy and revenue administration should work to improve tax compliance.

This chapter was prepared by a team led by Ali Mansoor and Cemile Sancak and comprised of Leandro Medina, Romain Bouis, Hilary Devine, Mehmet Cangul, and Frank Wu, with contributions from Luisa Charry, Yun Liu, Manabu Nose, Alun Thomas, and Arina Viseth.

[1] Household enterprises are microenterprises, as inferred from household surveys, that are comprised of persons who are earning money but not in salaried employment. Subsistence agriculture is included if its production is sold.

- To help expand the scope of the formal sector and facilitate the transition of resources from the informal to the formal sector, the authorities need to focus on improving access to finance and fostering product market efficiency. Deepening financial markets is possible if the overall business environment is friendly to small and medium-sized enterprises (SMEs). Particularly, important components of product markets are the cost to export and the cost of enforcing contracts together with access to electricity.

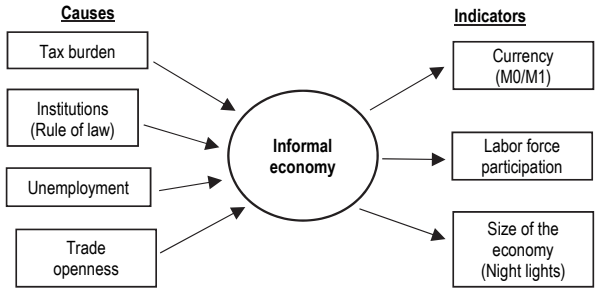
SIZE AND NATURE OF THE INFORMAL ECONOMY

As the informal economy cannot be directly observed, its magnitude needs to be estimated. There are, broadly, three approaches in the literature: direct estimates through surveys; indirect estimates using one indicator of the informal economy (for example, electricity consumption or currency demand); and parametric models (see Annex 3.1 for a general description of these approaches). This chapter uses a parametric model, the Multiple Indicator–Multiple Cause (MIMIC) Model.[2]

The MIMIC Model uses indirect measures of the entire economy to derive the size of the informal economy that is "unobserved" in the surveys that form the basis of the national accounts. It estimates the unobserved informal sector by explicitly considering the multiple causes of the existence and growth of the informal economy, as well as its multiple effects (Figure 3.1).

The MIMIC Model in this chapter covers a sample of 140 countries during 1991–2014. Moreover, it has been refined to respond to past criticisms of the methodology.[3] The MIMIC Model relies on the following observable drivers of the informal economy:

Figure 3.1. Estimation of the Informal Economy: The Multiple Indicator–Multiple Cause Model



Source: Prepared by the authors.

- *Tax burden*. A larger tax burden is likely to encourage more economic activity to remain in the informal economy.
- *Institutional development*. Lack of respect for the law would encourage informal activity.
- *Official unemployment rate*. Higher unemployment rates would indicate poorly functioning labor markets with labor not being absorbed into the formal sector.
- *Trade openness*. Trade liberalization could reduce informality by increasing opportunities in the globally competitive part of the economy and, as a consequence, shift resources from the informal sector.

The MIMIC Model also uses measurable indicators of the informal economy, namely:

- Currency as a fraction of broad money, as people engaged in the informal economy usually conduct their activities in cash.
- Labor force participation.
- A measure of the size of the economy using night lights. Data on light intensity from outer space are employed as a proxy for the "true"

[2] The MIMIC model was first used by Frey and Weck-Hanneman (1984) to estimate the size of the informal economy in countries in the Organisation for Economic Co-operation and Development. It was later used in a number of studies, including Loayza (1997) and Schneider, Buehn, and Montenegro (2010).

[3] A key criticism is that most studies using this methodology are subject to endogeneity, as they use GDP on both sides of the MIMIC equation, that is, GDP per capita as a cause, and growth of GDP per capita as an indicator. Annex 3.2 explains how the MIMIC model has been refined here to address past shortcomings.

economic growth achieved by countries, which is independent of GDP measures traditionally used and also reduces the endogeneity concerns in previous MIMIC models.

The MIMIC methodology uses the association between the observable causes and the effects of an unobserved variable, in this case the informal economy, to estimate the dynamics of the variable itself.[4] We then apply these estimated dynamics to a starting value—chosen to be 2000 and estimated for each country by Schneider (2007) using a currency demand model—to obtain annual values of the informal economy as a share of GDP.

Our estimates suggest significant heterogeneity in the size of informal economies in sub-Saharan Africa, ranging from a low of 20 to 25 percent in Mauritius, South Africa, and Namibia to a high of 50 to 65 percent in Tanzania and Nigeria (Figure 3.2).

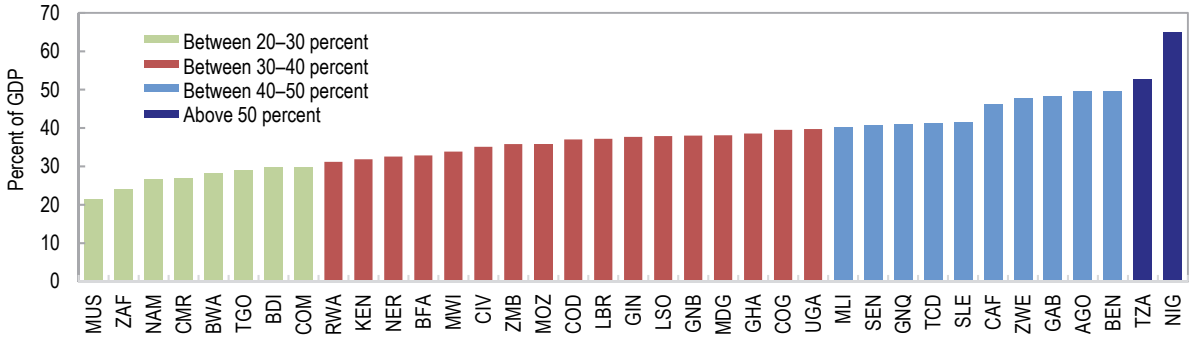
The informal economy in sub-Saharan Africa remains among the largest in the world, although this share has been very gradually declining, as seems to be the case globally (Figure 3.3, panel 1). Informality appears to be persistent even in advanced economies, which suggests that, even with reforms, the shift from informal to formal will take time. The sub-Saharan Africa unweighted average share of informality reached almost 38 percent of GDP during 2010–14. This is surpassed only by Latin America and the Caribbean, at 40 percent of GDP and compares with 34 percent of GDP in South Asia, and 23 percent of GDP in Europe. In member countries of the Organisation for Economic Co-operation and Development (OECD), the informal sector is estimated to account for 17 percent of GDP.

Informality seems to fall with the level of income, likely reflecting higher government capacity and better incentives toward formality in higher-income economies (Figure 3.3, panel 2).

That global trait also holds within sub-Saharan Africa, as the informal economy averages 40 percent in the region's low-income countries and 35 percent in its middle-income countries (Figure 3.3, panel 3). Oil exporters are more likely to harbor informality, with an informal economy close to 50 percent of GDP.

While per capita income level is, on average, an important indicator of informality, it is not a determining indicator, as demonstrated by similar informality levels in sub-Saharan Africa and Latin America and the Caribbean. Countries with similar per capita income levels can have significantly different informality levels based on the evolution of their drivers of informality, such as trade openness and institutions, as captured in the MIMIC Model (for example, Benin and Togo, as confirmed also by their national accounts statistics, as seen in Table 3.1, and Mauritius and Gabon, as seen in Figure 3.4, panels 1 and 2).

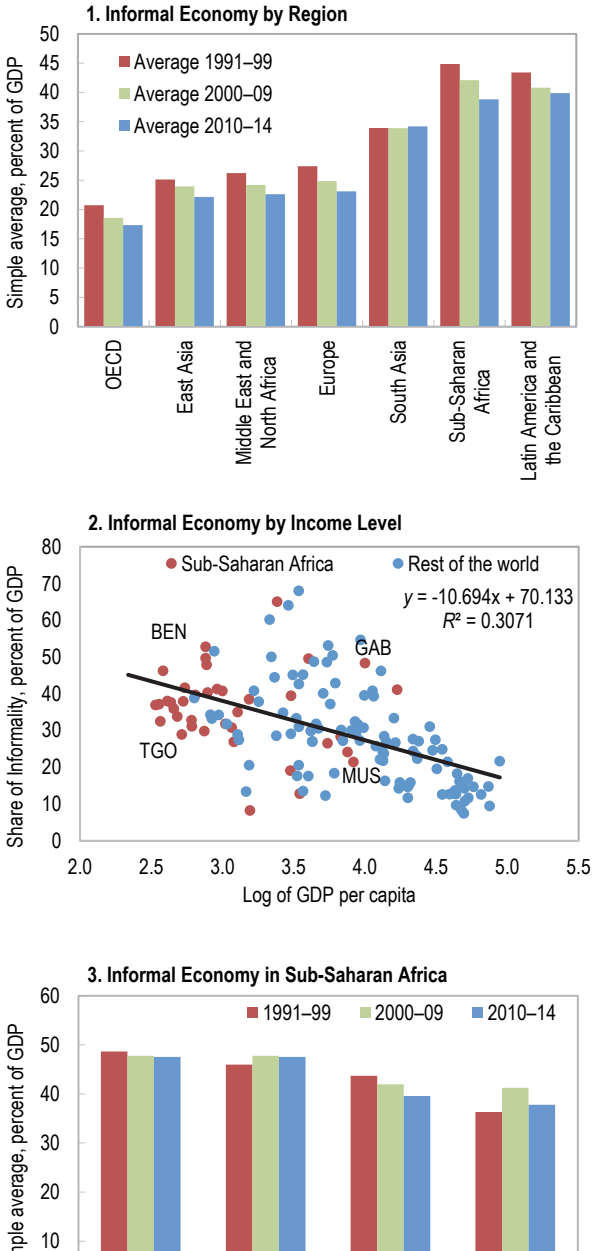
Figure 3.2. Sub-Saharan Africa: Estimates of the Informal Economy, Average over 2010–14



Source: IMF staff calculations.
Note: Excludes Cabo Verde, Eritrea, Ethiopia, The Gambia, São Tomé and Príncipe, Seychelles, and South Sudan due to lack of an informality measure. See page 72 for country abbreviations.

[4] The model consists of two parts, a structural equation model that determines the unobserved variable by a set of exogenous causes, and the measurement model using maximum likelihood as the fitting function.

Figure 3.3. Informal Economy by Region, Income Level, and Type of Economy



Source: IMF staff calculations.

Note: LIC = low-income countries; MIC = middle-income countries; OECD = Organisation for Economic Co-operation and Development. See Annex Table 3.4.1, page 66 for country classifications.

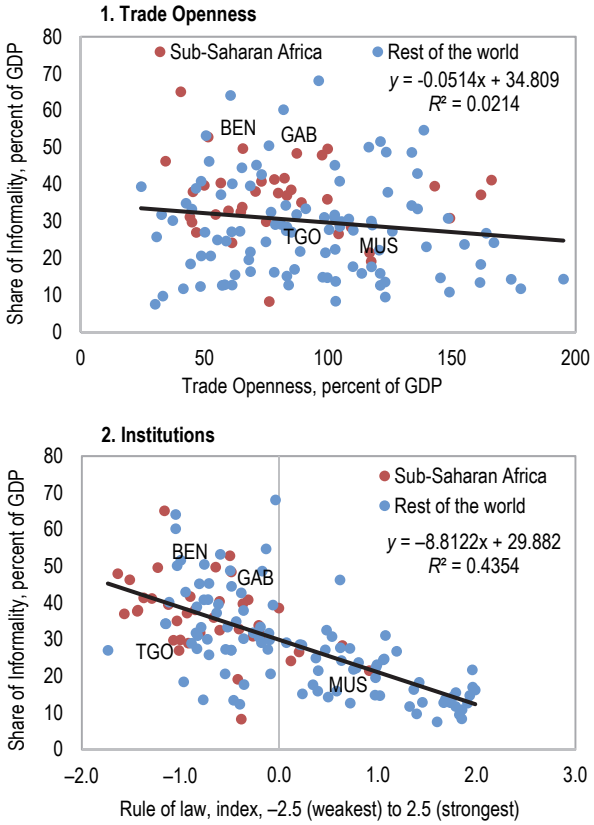
Table 3.1. Selected Sub-Saharan African Countries: Comparison of Informality Rankings between Multiple Indicators

Informality Level	Country	National Accounts	MIMIC (Rank)
Low	Côte d'Ivoire	1	3
Low	Togo	2	1
Low	Burkina Faso	3	2
Medium	Senegal	4	6
Medium	Guinea	5	4
Medium	Guinea-Bissau	6	5
High	Mali	7	7
High	Benin	8	8

Source: IMF staff calculations.

Note: Correlation: 0.73 Spearman's Rank Correlation: 0.857***; MIMIC = Multiple Indicator—Multiple Cause Model.

Figure 3.4. Trade Openness and Institutions as Drivers of Informality



Sources: World Bank, World Governance Indicators; and IMF staff calculations.

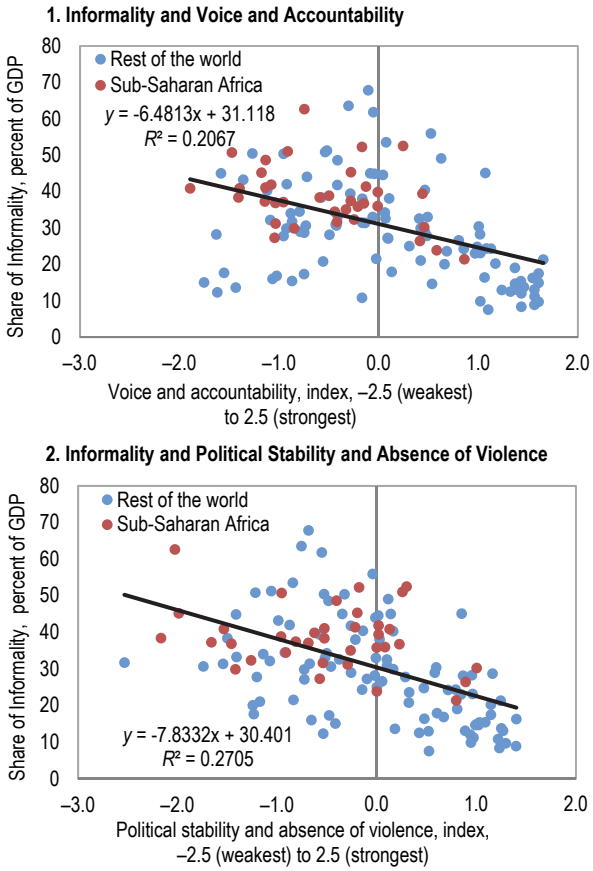
Other institutional indicators, as measured by various subcomponents of the Worldwide Governance Indicators, are also found to be inversely related to the size of the informal economy (Figure 3.5).[5]

How Reliable are Estimates of the Size of the Informal Economy?

The robustness of the MIMIC estimates was cross-checked using two approaches. First, an alternative and fully independent approach, the Predictive Mean Matching method (PMM) was used (Rubin 1987). This alternative method treats informality as a missing data problem (Little and Rubin 1987). The objective is to match the countries where survey data exist on the size of the informal economy to those where data are missing.[6] The distinctive feature of the PMM is that it provides a tool for a matching process, rather than a regression model, to estimate the size of the informal economy. The groupings of the countries based on the estimated size of their informal economy are broadly aligned with the MIMIC findings (see Annex 3.2 for further details on the PMM approach).

A second robustness test is to check the MIMIC estimates with the estimates of statistical agencies of the eight sub-Saharan African countries that publish their estimates of the size of the informal economy (Table 3.1). The rank correlation is high (86 percent) between the MIMIC results and these estimates. While the estimates of statistical agencies are useful, their applicability is limited for cross-country comparisons. First, not all countries publish the information. Second, methodologies and sampling methods may affect the comparability of cross-country estimates. Finally, estimates may be rooted in approaches that fail to take account of recent changes in the domestic economy. In contrast, the MIMIC Model estimates the size of the informal economy for a large number of countries producing comparable results.

Figure 3.5. Informality and Governance Quality, Average over 2006–14



Sources: World Bank, World Governance Indicators; and IMF staff calculations.

Causes and Nature of Informality in Sub-Saharan Africa

What drives this large degree of informality in the region? Survey data provide some insights.[7] In terms of the experience of its populations as entrepreneurs, sub-Saharan Africa has the highest rate of total early-stage entrepreneurial activity and nascent entrepreneurship, which respectively measure the share of the working-age population that is in the process of starting a business and the share whose business is less than four months old (Figure 3.6, panel 1).

[5] The Worldwide Governance Indicators cover six key dimensions of governance: (1) voice and accountability; (2) political stability and absence of violence; (3) government effectiveness; (4) regulatory quality; (5) rule of law; and (6) control of corruption. The higher the indicator, the better the quality of governance.

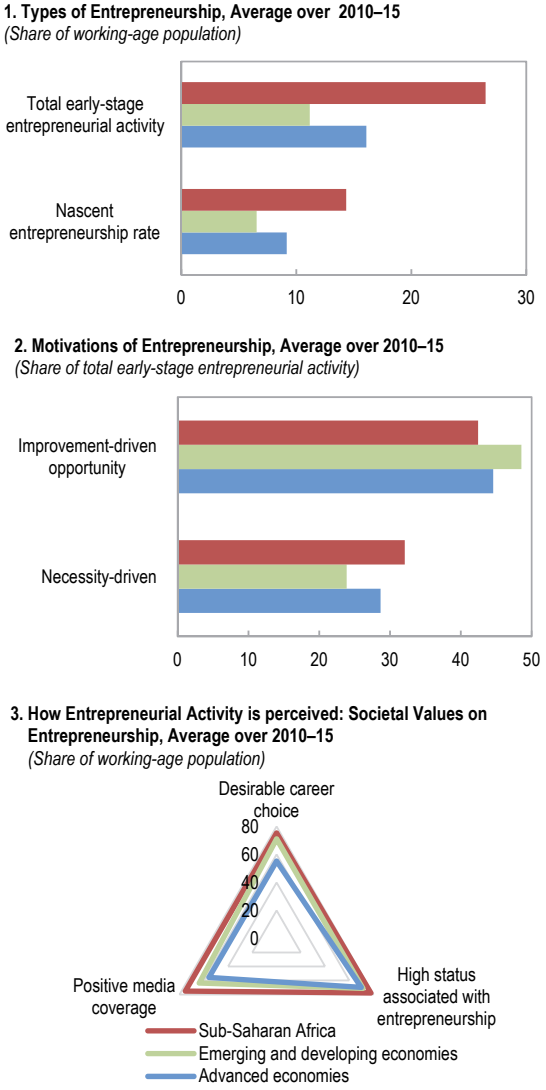
[6] Forty-nine countries were identified as having survey-based estimates of the size of their informal economies, including nine in sub-Saharan Africa.

[7] This section is based on the two surveys conducted by the Global Entrepreneurship Monitor (GEM): The Adult Population Survey (APS) and the National Expert Survey (NES). While the APS collects primary data on entrepreneurship and provides key information on the entrepreneurial behavior and attitudes of individuals, the NES monitors the national context, focusing on the factors that are expected to have a specific impact on entrepreneurial attitudes and activities. Entrepreneurship and self-employment data have been commonly used as proxies for informal sector activities.

As in other parts of the world, the primary reported motivation for becoming an entrepreneur is an improvement-driven opportunity. However, about a third of the new entrepreneurs in sub-Saharan Africa report that they chose to be entrepreneurs out of necessity, slightly higher than other parts of the world (Figure 3.6, panel 2).

Nevertheless, sub-Saharan Africa has the most positive attitude towards entrepreneurship, with the largest share of its working-age population that considers entrepreneurship as a desirable career choice and believes that high status is associated with the activity (Figure 3.6, panel 3).

Figure 3.6. Main Attributes of Informality



Source: Global Entrepreneurship Monitor (GEM) database.

The policy challenge is, therefore, to create an environment where small firms—in both the formal and informal sectors—can thrive and grow. Such an environment that is supportive of SMEs can, as discussed in Box 3.1, facilitate the expansion of the formal sector.

INTERACTION BETWEEN INFORMALITY AND ECONOMIC PERFORMANCE

Given the relatively large size of informality in sub-Saharan Africa, how does this impact economic outcomes?

Informality as a Safety Net

In the absence of sufficient opportunities in the formal sector, informal activity is an essential safety net that provides employment and income to a large number of people who might otherwise be bound to poverty. Surveys by the International Labour Organization (ILO) report that 30 to 90 percent of employment in the nonagricultural sector occurs in the informal sector in some sub-Saharan African countries (Table 3.2).[8]

Household surveys also confirm that the informal sector plays an important role in employment in sub-Saharan Africa. Between 55 and 75 percent of nonagricultural employment in low-income and resource-rich countries in sub-Saharan Africa occurs in household enterprises (Figure 3.7).[9] The distribution of salaried employment and household enterprises differs according to the income level of the country. As expected, the upper-middle-income countries have the highest ratio of salaried workers among nonagricultural workers. On the other hand, resource-rich countries have the highest ratio of household enterprises in all income groups, consistent with the MIMIC estimations of the informal sector.

Information on per capita consumption from household surveys supports the view that household enterprises serve to improve opportunities relative to the agricultural sector. Figure 3.8 shows the share of workers in agriculture and household

[8] The numbers reported by the ILO suggest that the share of informal employment in total employment is generally higher than the share of the informal economy in the total economy.

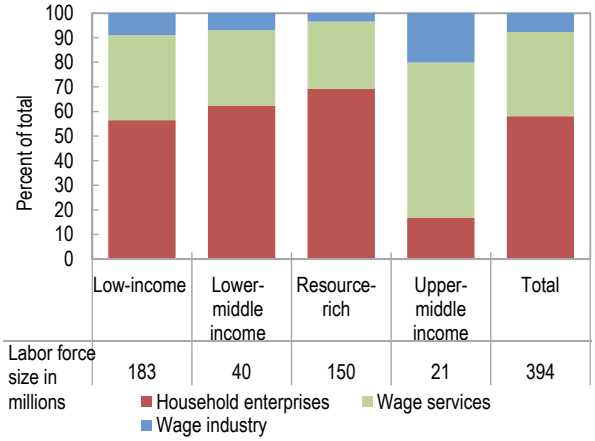
[9] Fox and others (2013).

Table 3.2. Sample of Sub-Saharan African Countries: Informal Employment, 2004–12
(Percent)

Year	Country	Share of Informal Employment in Nonagricultural Employment
2010	South Africa	33
2008	Lesotho	35
2008	Namibia	44
2010	Liberia	60
2008	Zambia	70
2006	Tanzania	76
2004	Mali	82
2012	Madagascar	89

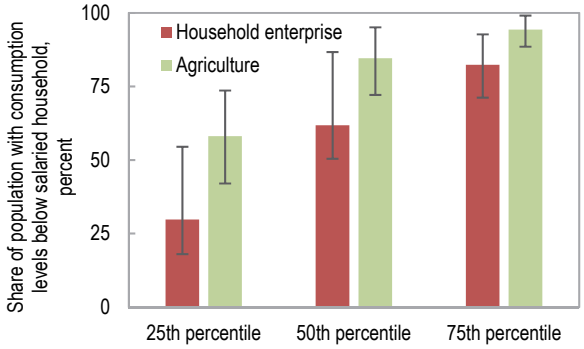
Source: International Labour Organization (ILO).
Note: Countries listed are those for which data are available.

Figure 3.7. Sub-Saharan Africa: Distribution of Salaried Employment and Household Enterprises, 2010



Sources: Household surveys; and IMF staff calculations.
Note: See Annex Table 3.4.1, page 66 for country classifications. Resource-rich countries include Angola, Chad, Democratic Republic of Congo, Republic of Congo, Guinea, Nigeria, and Zambia.

Figure 3.8. Sample of Sub-Saharan African Countries: Comparison of Consumption across Household Enterprises and Agricultural Workers



Sources: Household surveys for Cameroon, Ghana, Mali, Rwanda, Uganda, and Zambia; and IMF staff calculations.
Note: The percentiles correspond to the percentiles of the income distribution of salaried workers. The black bars represent the range across countries in the sample.

enterprises that have per capita consumption levels below that of salaried workers at the 25th, 50th, and 75th percentiles in six low-income countries in Africa. Workers in the agricultural sector have per capita consumption levels considerably lower than households with salaried workers, with on average 60 percent of agricultural workers having consumption levels below the 25th percentile of salaried workers. The situation is considerably better for household enterprises, although the consumption level remains below that of salaried employment at the 50th and 75th percentiles. This is also the case at the 25th percentile for all except Rwanda and Uganda, where consumption is similar to that of salaried workers.

Informality and Productivity

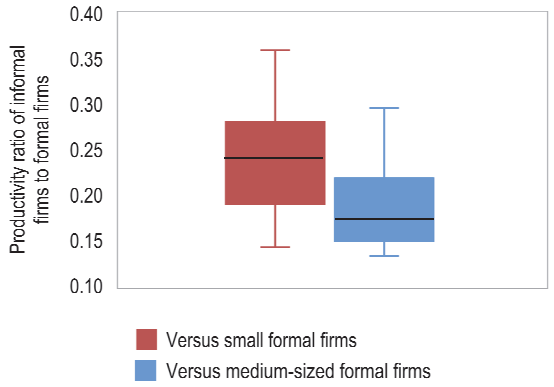
In a context where employment is particularly large in the informal sector, productivity in this sector has important implications for economic performance. Calculations based on World Bank Enterprise Surveys suggest that the productivity level of informal firms is significantly lower than formal firms (Figure 3.9).[10,11] On average, the productivity of informal firms is only 25 percent that of small formal firms and 19 percent of medium-sized formal firms, based on real output per employee. This likely reflects a lower level of physical capital and skill levels of workers.

There are also large country variations in the informal-formal productivity gap that reflect different levels of relative inefficiency of the informal sector. The productivity gap in real output per employee is particularly wide in some countries (for example, Kenya, Namibia, Niger, Senegal, Swaziland, and Tanzania) where more productive

[10] Data on informal firms come from the informal sector and microenterprise surveys that cover unregistered firms that exist without the government's knowledge. Following La Porta and Shleifer (2008), the data on formal firms are taken from the World Bank's Enterprise Surveys, in which firms are grouped into three categories according to the number of employees: fewer than 20 (small), between 20 and 99 (medium), and 100 or more (big).

[11] The informal-formal productivity gap is computed based on real output per employee in purchasing power parity terms for 16 sub-Saharan African countries. Firm productivity is often measured by nominal sales, but the sales-based measurement combines both physical output and prices. Given the absence of price indices for informal firms, real output per employee is used to measure firms' physical productivity following the approach proposed by Hsieh and Klenow (2009).

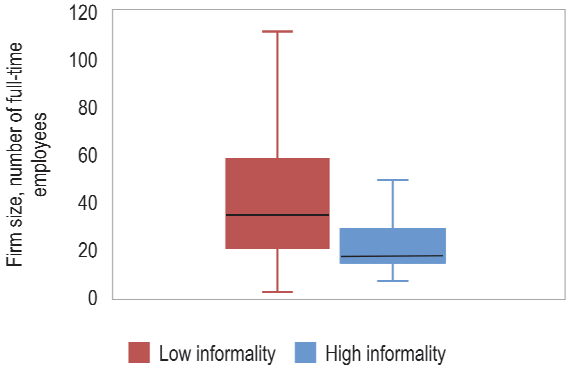
Figure 3.9. Sub-Saharan Africa: Productivity of Informal Firms Relative to Formal Firms



Sources: World Bank Enterprise Survey; La Porta and Shleifer (2008); and IMF staff calculations.

Note: The figure represents relative productivity of all informal firms versus both small and medium-sized formal firms. The box plot depicts the distribution of productivity ratio, with the middle line indicating the mean, the lower and upper boundaries of the box the 25th and 75th percentiles, respectively, and the lower and upper lines the 10th and 90th percentiles, respectively. Results are based on a sample of 16 sub-Saharan African countries.

Figure 3.10. Sub-Saharan Africa: Informality and Firm Size



Sources: World Bank Enterprise Survey; and IMF staff calculations.

Note: The level of informality is defined as the proportion of firms not registered when the business started. For each group, the box plot depicts the distribution of the firm size, with the middle line indicating the mean, the lower and upper boundaries of the box the 25th and 75th percentiles, respectively, and the lower and upper lines the 10th and 90th percentiles, respectively. See footnote 13 for definition of low and high informality. Results are based on a sample of 16 sub-Saharan African countries.

formal and less productive informal firms coexist in a more segmented market. A similar pattern is observed for the ratio of value added per employee.

Informality and Size of Firms

Relatedly, average firm size is significantly smaller for informal firms than formal firms in sub-Saharan Africa.[12] Informal firms are typically microenterprises with less than five workers, which is only about 30 percent of the average size of small formal firms and 7 percent the size of medium-sized formal firms.

Consequently, average firm size is much smaller in high-informality regions than in low-informality regions. Figure 3.10 shows the distribution of the average size of firms between the two groups and confirms that the size of firms in sub-Saharan African countries is significantly smaller for the high-informality regions at any part of the distribution.[13] The proportion of small firms is 71 percent in sub-Saharan Africa, somewhat higher than in economies outside sub-Saharan Africa, where the proportion of small firms is only 61 percent.

This means that in sub-Saharan Africa, there is scope for policy action to raise productivity and output by shifting resources to the formal sector.

Informality is a Vicious Cycle

Unfortunately, in an environment of low access to credit and poor conditions for entrepreneurship, many of the features of informal household enterprises (small size, low productivity) are the very ones that sustain a vicious cycle that keeps the informal sector large (Figure 3.11). La Porta and Shleifer (2008) identify the cost of financing and access to financing as the key obstacles that keep informal firm size small.

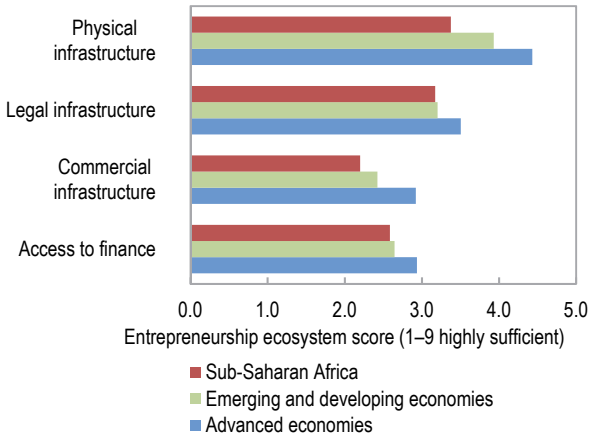
Informality and Tax Policy

While increasing domestic revenue mobilization from the informal economy is often seen as a key objective, reducing informality cannot form the basis of tax policy, as the reasons for not paying taxes vary across informal firms. In designing tax policy, the reasons for not paying taxes matter as much as or more than the fact that a firm pays no taxes (Kanbur and Keen 2015). Informality usually implies nonremittance of the full amount of taxes due. Individuals or firms may not remit

[12] Firm size is measured by the average number of full-time employees.

[13] Using the World Bank's Enterprise Surveys, the size of informal firms is computed for 156 subnational regions in sub-Saharan African countries, measured as the share of unregistered informal firms in each region. Based on this measure, the subnational regions are grouped into a low-informality group (below-average level of informality) and a high-informality group (above-average level).

Figure 3.11. Sub-Saharan Africa and Comparators: Conditions for Entrepreneurship, Average over 2010–15



Source: Global Entrepreneurship Monitor (GEM) database.

taxes because they are below the threshold at which they are legally obliged to pay taxes. This may be inevitable for most household enterprises due to their small size, while some larger firms may choose to operate just below the threshold. On the other hand, some larger firms may evade taxes either by partially declaring taxes or by not declaring them at all, even though they are above the tax threshold.

Lumping these informal firms into a single category can lead to misleading policy conclusions. For example, while conventional wisdom suggests that lowering tax rates would broaden the tax base, an optimal tax policy would instead suggest raising the value-added tax (VAT) threshold taking into account the different categories of informality. Raising the VAT threshold would encourage firms that choose to operate just below the threshold to increase production, while leaving the number of informal firms and the amount of tax collection unchanged (Kanbur and Keen 2014). Indeed, relatively high VAT thresholds are recommended for developing countries, with license fees or turnover taxes for businesses below the VAT threshold. This avoids small firms being discouraged from registering with the tax administration and ensures that scarce government resources are directed to enforcing compliance by large firms.[14]

[14] IMF (2011). The appropriate level of VAT thresholds should be determined on a case-by-case basis, informed by a range of factors including the size and record keeping capacity of businesses currently falling above the VAT threshold.

Increased growth and transition to formality would over time allow some household enterprises to grow to a size above the tax threshold, generating higher fiscal revenue. The benefit of formalization would be better access to finance and public services, which could exceed the tax cost. It is also worth noting that although household enterprises do not pay direct taxes, they pay a significant share of their income in indirect taxes (for example, the VAT on their inputs) and other charges. Helping them do better in the informal sector without imposing additional direct taxes on them would still generate additional revenue.

As for firms that are above the tax threshold but choose to evade taxes either partially or fully, tax policy and revenue administration should work to improve tax compliance. In this context, a simple system with limited exemptions that is easy to comply with would be helpful both to improve the overall business climate and facilitate compliance. At the tax policy level, countries should, therefore, focus on simplifying tax laws and reducing taxes on microenterprises and small businesses. At the tax administration level, revenue agencies should develop integrated compliance management strategies, including (1) reducing community tolerance for tax evasion; (2) providing targeted assistance to promote voluntary compliance; (3) encouraging self-regulation which may itself rest on simplification; and (4) demonstrating a visible and credible detection and enforcement capability (Russell 2010).

PATHWAYS TO EXPAND THE FORMAL SECTOR

There are two pathways to expand the formal sector: (1) increase the size of formal enterprises and the entrance of new formal firms; and (2) transform informal enterprises into formal enterprises. The latter is possible if the business environment allows informal enterprises to grow and enter the formal sector. In previous studies and as documented in the World Bank's Enterprise Surveys, the cost of financing and access to financing are identified as key obstacles to the growth of informal enterprises as well as private formal enterprises. Inefficiencies in labor and product market regulations may create incentives for enterprises to work outside

the regulatory framework. The importance of these variables for expanding the formal sector is tested here in a panel regression.

The panel data generated through the MIMIC Model allow for extending the literature by establishing more robust and comprehensive empirical results. To filter out country-specific and time-specific effects while controlling for endogeneity, we use the Arellano-Bond generalized method of moments estimator for a sample of 108 countries from 2006 to 2014. Regression 1 of Table 3.3 tests for the effects of financial market and product market efficiency. Regression 2 includes an advanced economy dummy. Regression 3 checks the significance of oil exporters using an oil exporter dummy. Regression 4 adds labor market flexibility, and regression 5 incorporates an index constructed on the basis of components of the World Bank's Worldwide Governance Indicators that considers accountability of government and political stability.[15]

Key results from the regressions include:

- The size of the informal sector changes slowly. The strong significance of the lagged share of informality in all specifications points to a high level of persistence of informality.

- As the economy grows, the informal sector declines in importance, as reflected in a strongly significant negative relationship with GDP per capita growth in all specifications.

- Financial market efficiency is strongly associated with a reduction in informality. This variable, which is a proxy for access to finance, consists of five subcomponents: financial services meeting business needs, affordability of financial services, financing though local equity markets, ease of access to loans, and venture capital availability.[16] Financial market efficiency remains significant and robust under various specifications, including when adding the growth rate of GDP per capita to control for growth effects.[17, 18] These results are consistent with the findings of the World Bank's Enterprise Surveys, indicating that the greatest perceived constraint for both informal and formal enterprises is a lack of access to finance .

- Product market efficiency lowers the share of the informal sector, consistent with the findings of the literature,[19] although only for some subcomponents of the World Bank's Doing Business Indicators such as the cost to export and the cost of enforcing contracts. The cost of enforcing contracts points to the importance of the legal system, while the cost to export can be considered as a proxy for trade liberalization, both of which are found to support the existence of informality when costs are high.[20]

- Labor market flexibility, on the other hand, is not found to be significant.[21]

- No statistically significant relationship is found between the size of the informal economy and either governance indicators or the macroeconomic environment (proxied by a subcomponent of the Global Competitiveness Index).

- Neither the advanced economy dummy nor the oil exporter dummy is found to be significant when included with policy variables.

[15] We construct an index using Principal Components Analysis (PCA) on the voice and accountability and political stability and absence of violence components of the World Governance Indicators.

[16] The variable is from the World Economic Forum's Global Competitiveness Index and is survey-based. The higher the index value, the more efficient the market.

[17] Annex 3.3 presents a regional overview of the associations between the size of the informal economy and aggregate values of the indices for regions. There is a broad association at the aggregate level, although it is weak for governance indicators.

[18] The control variable is the growth rate rather than the level of per capita GDP, which is nonstationary. Nonstationarity may cause problems if added directly into the regression (see La Porta and Schleifer 2014).

[19] See, for example, Loayza, Oviedo, and Serven (2005).

[20] The cost to export (U.S. dollars per container) measures the cost (excluding tariffs) associated with three sets of procedures—documentary compliance, border compliance, and domestic transport—within the overall process of exporting a shipment of goods.

[21] Similar to the Financial Market Efficiency Index, this variable is from the World Economic Forum's Global Competitiveness Index and is largely survey-based. It consists of five subcomponents: cooperation in labor-employer relations, flexibility of wage determination, hiring and firing practices, redundancy costs, and the effect of taxation on incentives to work.

Drilling Down on Product-Market and Competitiveness Indicators

At the micro level, movement of resources to the formal sector will be facilitated by policies that help reduce the costs of becoming and staying formal. Insight can be gained on areas where governments with large informal sectors should focus reform by identifying the subcomponents of the World Bank's Doing Business Indicators and the World Economic Forum's Global Competitiveness Indicators where the gap is largest between countries with small and large informal sectors (Table 3.4). This analysis suggests that key areas of focus for policymakers could be improving the protection of property rights, increasing electricity provision, lowering the burden of customs procedures, while enhancing the ease of exporting and the reliability of infrastructure.

Table 3.3. Share of Informality and Policy Variables

	Dependent Variable: Share of Informality[1]				
	(1)	(2)	(3)	(4)	(5)
Lagged share of informality	0.963***	0.820***	0.781***	0.800***	0.827***
	(20.00)	(6.89)	(5.64)	(6.76)	(8.44)
Growth rate of GDP per capita (2011 U.S. dollars, PPP)	–0.422***	–0.290***	–0.273***	–0.260***	–0.205***
	(–3.18)	(–2.77)	(–2.61)	(–2.76)	(–2.91)
Flexibility of labor market (CGI)				0.590	0.460
				(0.67)	(0.57)
Efficiency of financial market (CGI)	–2.551**	–1.817***	–1.718**	–1.633**	–1.159*
	(–2.12)	(–2.79)	(–2.29)	(–2.46)	(–1.87)
Cost of doing business[2]	1.340**	1.106*	1.682*	1.600*	1.492*
	(2.06)	(1.69)	(1.67)	(1.76)	(1.74)
Governance indicator[3]					0.393
					(0.53)
Advanced economy dummy		–3.273	–2.695	–2.811	–3.283
		(–1.43)	(–0.97)	(–1.22)	(–1.22)
Oil exporter dummy			5.314	2.483	2.293
			(0.62)	(0.49)	(0.51)
Constant	9.064*	11.57**	10.59**	7.623	5.854
	(1.77)	(2.45)	(2.00)	(1.35)	(1.18)
Number of observations	803	803	803	803	803

Source: IMF staff calculations.

Note: Estimates using the Arellano and Bond system-generalized method of moments estimator, including year fixed effects. Robust t-statistics in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01. CGI = Global Competitiveness Index; PPP = purchasing power parity.

[1] Taken from the MIMIC estimates.

[2] Based on an average of the standardized indices of cost to export and of the cost of enforcing contracts (World Bank, Doing Business database).

[3] First component from Principal Component Analysis of "Voice and Accountability" and "Political Stability and Absence of Violence" (Worldwide Governance Indicators).

Table 3.4. Sub-Saharan Africa: Doing Business and Global Competitiveness Indicators with the Largest Statistically Significant Difference between Low- and High-Informality Countries

Indicators	Low Informality (Bottom quintile)	High Informality (Top quintile)	Comparison of Means (*t*-test)
Getting electricity: Procedures (number)[1]	4.4	6.7	0.01
Time to export: Documentary compliance (hours)[1]	55	105	0.01
Irregular payments and bribes, 1–7 (best)[2]	4.2	3.1	0.02
Property rights, 1–7 (best)[2]	4.6	3.5	0.03
Reliability of infrastructure, 0–8 (best)[1]	2.7	0.4	0.03
Burden of customs procedures, 1–7 (best)[2]	4.2	3.3	0.03
Doing Business Indicators - Country Rank[1]	107	154	0.03

Sources: [1] World Bank, Doing Business Indicators; [2] World Economic Forum, Global Competitiveness Report.

POLICY IMPLICATIONS

The analysis in this chapter suggests that creating more opportunities for resources to migrate from the informal sector by expanding the formal sector would increase productivity in the economy and could be an important mechanism to unlock sustained inclusive growth. However, as this transformation is expected to be slow, policies must also be set to support household enterprises that provide a safety net for those who would otherwise likely be unemployed. The good news for policymakers is that many of the same policies that support the growth of the formal sector also help raise the productivity of household enterprises.

Accordingly, policymakers should:

- Recognize that household enterprises are an important component of the economy—providing a safety net for the large and growing working-age population—that is likely to remain for many years to come. The authorities should therefore focus on policies to foster the productivity of household enterprises rather than policies to increase tax revenues collected from these enterprises. On the other hand, for larger firms that choose to evade taxes either partially or fully, revenue authorities should work to improve tax compliance.
- Focus on improving access to finance and enhancing product market efficiency, especially where indicators show the largest gap compared to countries with smaller informal sectors. This should help expand the scope of the formal sector both by transitioning from the informal to the formal sector and by expanding the formal sector. Improving access to finance is key to expanding the scope of the formal sector, and while access to formal financial services is often difficult in low-income countries, countries may focus on developing technological innovation within the financial sector, for example via mobile banking or Fintech. Fostering product-market efficiency also plays a role. The cost to export and the cost of enforcing contracts appear to be particularly important, together with access to electricity.

Box 3.1. Success in Expanding the Formal Economy: The Cases of Mauritius and Rwanda

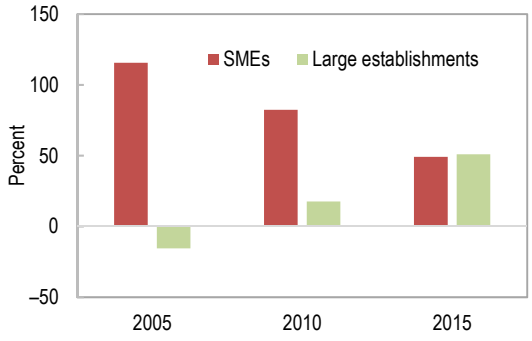
During 2010–14 relative to 1996–2000, Mauritius reduced informality from what was already a low level by a further four percentage points of GDP, reaching the levels of the Organisation for Economic Co-operation and Development (OECD). Similarly, Rwanda reduced the size of its informal sector significantly over the same period. These results reflect movement from informal household enterprises to formal small and medium-sized enterprises (SMEs) as a result of proactively creating a business environment for SMEs to flourish, removing identified barriers to formalization, and strengthening the capacity of these enterprises to become more competitive.

Rwanda has reformed commercial law, improved regulations to ease access to credit, and accelerated trade and property registration. Rwanda outperforms OECD standards in terms of the procedures to start a formally registered business.

In Mauritius, since the reforms that opened the economy in the early 1980s, successive governments have proactively supported SMEs by improving access to financing, providing free export market intelligence, and developing industrial parks. These efforts were intensified in response to the loss of trade preferences in textiles and sugar and the onset of the global financial crisis in 2007. Labor market reforms protected workers instead of jobs, while liberalizing access to the global pool of both skilled and unskilled workers. In close consultation with the business community, programs were set up to share risks with the banking system to enable SMEs to obtain credit at the prime rate. Registration of firms was computerized to allow same-day creation and SMEs were provided a one-stop shop to assist with financing, information, and the delivery of permits and licenses. Tax reform facilitated compliance by SMEs. The playing field was leveled through extensive computerization, including for paying taxes online, by the Minister of Finance giving up his powers of discretion, and via regulations moving from ex-ante authorization to ex-post verification.

Despite the global financial crisis and the other shocks, employment in SMEs continued to grow in Mauritius between 2005 and 2010 and contributed more job growth than larger firms (Figure 3.1.1). More importantly, SMEs play a significant role in the economy, representing close to 40 percent of GDP and about 45 percent of total employment, reflecting the success of the policy initiatives to support the development of SMEs in the formal sector.

Figure 3.1.1 Mauritius: Share of Jobs Created in Small and Medium-sized Enterprises versus Large Establishments, 2000–15 (Percent)



Sources: Statistics Mauritius; and IMF staff calculations.
Note: SMEs = small and medium-sized enterprises.

Annex 3.1. Measuring the Informal Economy: Alternative Methodologies

This annex describes the main methodologies used to measure the informal economy, highlighting their advantages and drawbacks.[1] These approaches can be divided into direct or indirect, including the model-based ones.

The most common direct approaches to measuring the size of the informal economy rely on surveys and samples based on voluntary replies, or tax auditing and other compliance methods. While providing great detail about the structure of the informal economy, the results are sensitive to the way the questionnaire is formulated and to respondents' willingness to cooperate. Consequently, surveys are unlikely to capture all informal activities (see Isachsen and Strom 1985; Witte 1987; Mogensen and others 1995; and Feige 1997).

Indirect approaches, alternatively called "indicator" approaches, are mostly macroeconomic in nature. These are in part based on the discrepancy between national expenditure and income statistics; the discrepancy between the official and actual labor force; the "electricity consumption" approach of Kaufman and Kaliberda (1996); the "monetary transaction" approach of Feige (1979); the "currency demand" approach of Cagan (1958), among others; and the MIMIC approach. Specifically:

- ***Discrepancy between national expenditure and income statistics:*** If those working in the informal economy were able to hide their incomes for tax purposes but not their expenditure, then the difference between national income and national expenditure estimates could be used to approximate the size of the informal economy. This approach assumes that all the components of the expenditure side are measured without error and constructed so that they are statistically independent from income factors (see MacAfee 1980; and Yoo and Hyun 1998).

- ***Discrepancy between the official and actual labor force:*** If total labor force participation is assumed to be constant, a decline in official labor force participation can be interpreted as an increase in the importance of the informal economy. Since fluctuation in the participation rate might have many other explanations, such as the position in the business cycle, difficulty in finding a job, and education and retirement decisions, these estimates represent weak indicators of the size of the informal economy (see Contini 1981; Del Boca 1981; and O'Neill 1983).

- ***Electricity approach:*** Kaufmann and Kaliberda (1996) endorse the idea that electricity consumption is the single best physical indicator of overall (official and unofficial) economic activity. Using findings that indicate the electricity-overall GDP elasticity is close to one, these authors suggest using the difference between growth of electricity consumption and growth of official GDP as a proxy for the growth of the informal economy. This method is simple and appealing, but has many drawbacks, including that (1) not all informal economy activities require a considerable amount of electricity (for example, personal services) or the use of other energy sources (for example, coal, gas), hence only part of the informal economy growth is captured; and (2) the electricity-overall GDP elasticity might vary significantly across countries and over time (see Del Boca and Forte 1982; Portes 1996; and Johnson, Kaufmann, and Shleifer 1997).

- ***Transaction approach:*** Using Fischer's quantity equation, Money*Velocity = Prices*Transactions, and assuming that there is a constant relationship between the money flows related to transactions and the total (official and unofficial) value added, that is, Prices*Transactions = k (official GDP + informal economy), it is reasonable to derive the following equation: Money*Velocity = k (official GDP + informal economy). The stock of money and official GDP estimates are known, and money velocity can be estimated. Thus, if the size of the informal economy as a ratio of the official economy is known for a benchmark year, then the informal economy can be calculated for the rest of the sample. Although theoretically attractive,

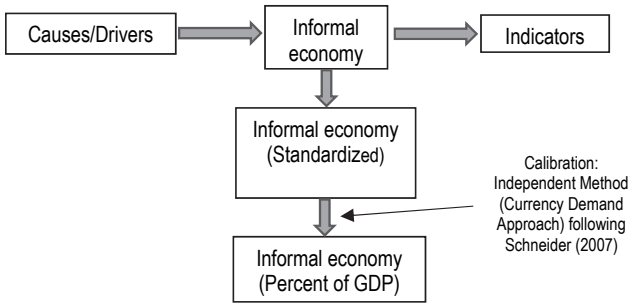
[1] Based on Schneider and Enste (2002).

this method has at least two weaknesses: (1) the assumption of *k* constant over time seems quite arbitrary; and (2) other factors like the development of checks and credit cards or mobile banking could also affect the desired amount of cash holdings and thus velocity (see Feige 1979; Boeschoten and Fase 1984; and Langfeldt 1984).

- ***Currency demand approach:*** Assuming that informal transactions involve cash payments as a way to avoid leaving an observable trace for the authorities, an increase in the size of the informal economy will consequently increase the demand for currency. To isolate this "excess" demand for currency, Tanzi (1980) suggests using a time series approach in which currency demand is a function of conventional factors, such as the evolution of income, payment practices and interest rates, and factors causing people to work in the informal economy, like the direct and indirect tax burden, government regulation, and the complexity of the tax system. However, there are several problems associated with this method and its assumptions: (1) This procedure may underestimate the size of the informal economy, because not all transactions take place using cash as a means of exchange; (2) Increases in currency demand deposits may occur because of a slowdown in demand deposits rather than an increase in currency used in informal activities; (3) It seems arbitrary to assume equal velocity of money in both types of economies; and (4) The assumption of no informal economy in a base year is arguable (see Cagan 1958; Gutmann 1977; Tanzi 1980, 1983; Schneider 1997; and Johnson, Kaufmann, and Shleifer).

- ***Multiple Indicators–Multiple Cause (MIMIC) approach:*** This method explicitly considers several causes as well as the multiple effects of the informal economy (Figure A3.1.1). The methodology makes use of the associations between the observable causes and the effects of an unobserved variable, in this case the informal economy, to estimate the variable itself (see Loayza 1997; Schneider, Buehn, and Montenegro 2010; Abdih and Medina 2016; and Vuletin 2009). The estimated MIMIC coefficients allow us to determine only relative estimated sizes of the informal economy in a particular country over time. In order to convert these measures into percent of GDP values we need to apply a benchmarking or calibration procedure. For this purpose, we use the Schneider (2007) calibration procedure, which takes the values from the year 2000 using the currency demand approach. This approach assumes that in order not to leave an observable trace, informal transactions are made in cash, and therefore, an increase in informality will consequently increase the demand for currency. This final step allows us to obtain a dynamic panel of the size of the informal economy in percent of GDP.

Annex Figure 3.1.1. The Multiple Indicators–Multiple Cause Model



Source: Prepared by the authors.

Annex 3.2. The Multiple Indicator–Multiple Cause Methodology and Innovations to Address Past Shortcomings

As the informal economy cannot be directly observed by definition, its magnitude needs to be estimated using an econometric method. Every econometric methodology used to estimate the informal economy has strengths and weaknesses, and the Multiple Indicator–Multiple Cause (MIMIC) Model is no exception.

The MIMIC's main features include the following: (1) the model explicitly considers multiple causes of the existence and growth of the informal economy, as well as multiple effects of the informal economy over time, whereas most other methods mainly use one indicator of the size of informal economy (for example, electricity consumption); and (2) the model is based on unobserved variables, taking into account a set of causes and indicators of the unobserved phenomenon to be measured.

Criticism of the MIMIC Model focuses on the following: (1) its use of GDP (GDP per capita and growth of GDP per capita) as cause and indicator variables; (2) the fact that the methodology relies on another independent study to calibrate from standardized values to the size of the informal economy in percent of GDP; and (3) the estimated coefficients are sensitive to alternative specifications, the country sample, and the time span chosen.

This chapter addresses the main criticisms. First, instead of using GDP per capita and growth of GDP per capita as cause and indicator variables, we use the night lights approach of Henderson, Storeygard, and Weil (2012) to independently capture economic activity. In their paper, those authors use data on light intensity from outer space as a proxy for the "true" economic growth achieved by countries. They also use the estimated elasticity of light intensity with respect to economic growth to produce new estimates of national output for countries deemed to have low statistical capacity. Therefore, by using the night lights approach we address MIMIC criticisms related to the endogeneity of GDP.

Second, an alternative and fully independent methodology, Multiple Imputation using Predictive Mean Matching (Rubin 1987; Little 1988), has been used to estimate the size of the informal economy. This alternative methodology broadly confirms the results from the MIMIC Model and provides confidence in the robustness of the results. Predictive Mean Matching uses survey-based observations of the size of the informal economy for 49 countries, and matches them to countries where data are missing through multiply-imputed datasets estimated by a linear regression. The distinguishing characteristic of the Multiple Imputation method is that, as its name suggests, instead of imputing a single point estimate for a missing data point, it produces a set of plausible estimates, building into the ultimate estimate the uncertainty associated with the missing data (Rubin 1987).[1] Once these plausible datasets are produced, results from them are then aggregated, often by an average, to make the final estimate.

The chapter uses Predictive Mean Matching to produce the estimates for each set of countries (Table A3.2.1). First, we estimate a linear regression of the informal economy size for all countries, including for the ones where we have observations, using covariates similar to those used in the MIMIC approach. Then a random draw is made from the posterior predictive distribution of the estimated coefficients for the covariates, which are then used to predict new values of the informal economy for all countries. The predicted values of the countries not missing the data are then matched to countries missing the data in groupings, and actual values for the countries not missing the data are used as estimates for the informal economy. Finally, the matches from each group in the respective samplings are averaged.[2]

[1] A point estimate has uncertainty associated with itself, manifested in confidence intervals. However, it does not incorporate this uncertainty into its estimation; the uncertainty is just an ex-post assessment. The Multiple Imputation procedure incorporates this uncertainty into the estimation itself.

[2] A critical element underlying this method is that the missing data mechanism is assumed to be "missing at random." This is a weaker assumption than "missing completely at random," but it still makes the assumption that while variables relevant for the informal economy can be related to the missing data mechanism, the probability of missing data itself is independent of the actual missing economy. This assumption can be challenged because one can argue that a large informal economy would be difficult to measure, resulting in missing data. Furthermore, a large informal economy can be associated with institutional weaknesses that would make it also less likely to be measured due to capacity constraints. However, when we look at survey data, we see that data are available for large informal economies such as Burundi and Niger. Therefore, at least in practice, the missing at random assumption is somewhat validated, but would have to be checked through sensitivity analyses.

The results, which are rankings of the size of informal economies size as percent of GDP from lowest to highest, are summarized in the Table A3.2.1.

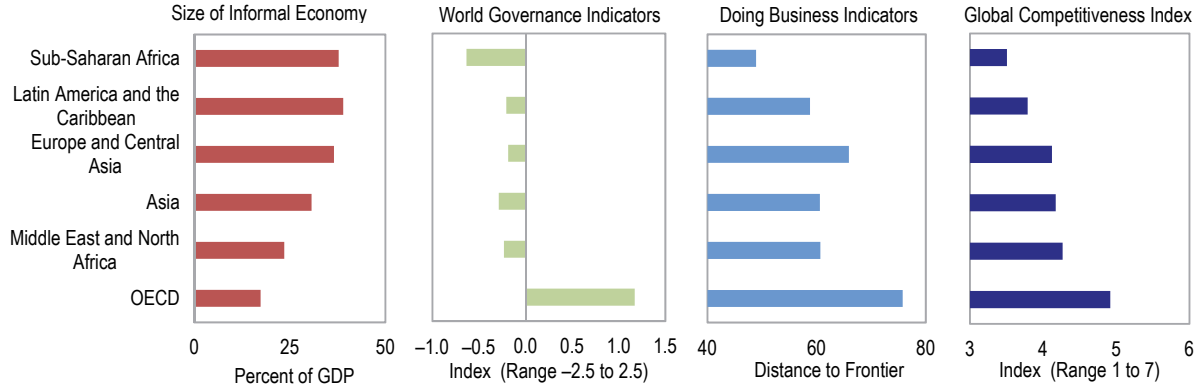
Table Annex 3.2.1. Selected Sub-Saharan African Countries: Informal Economy, Average 2000–12

Low-Size Countries (0-20 percent)	High-Size Countries (>40 percent)
Mauritius	Congo, Republic of
South Africa	Togo*
Botswana	Guinea-Bissau
Lesotho	Nigeria*
Swaziland	Mali
	Senegal*
Middle-Size Countries (20-40 percent)	Comoros
Cabo Verde	Congo, Democratic Republic of*
Namibia	Zambia
Kenya	Ghana
Zimbabwe	Guinea
Eritrea	Tanzania
Gabon	Ethiopia
The Gambia	Mauritania
Uganda	Central African Republic
Sierra Leone*	Angola
Cameroon*	Côte D'Ivoire
Malawi	Liberia
	Madagascar
	Equatorial Guinea
	Niger*
	Mozambique
	Burkina Faso
	Chad
	Burundi*

Sources: Survey estimates and Predictive Mean Matching Analysis.
*Based on survey estimates.

Annex 3.3. Association of Governance, Doing Business, and Competitiveness Indicators with the Size of the Informal Economy

Annex Figure 3.3.1. Selected Regions: Comparing Indicators with the Share of the Informal Economy



Sources: World Bank; World Economic Forum, and IMF staff calculations.
Note: OECD = Organisation for Economic Co-operation and Development.

Annex 3.4. Country Classifications

Annex Table 3.4.1. Country Classifications

Country	Oil exporters	Upper-middle income	Lower-middle income	Low-income	Fragile states
Angola	X		X		
Benin				X	
Botswana		X			
Burkina Faso				X	
Burundi				X	X
Cameroon			X		
Cabo Verde		X			
Central African Republic				X	X
Chad	X			X	X
Comoros				X	X
Democratic Republic of Congo				X	X
Republic of Congo	X		X		X
Côte d'Ivoire			X		X
Equatorial Guinea	X	X			
Eritrea				X	X
Ethiopia				X	
Gabon	X	X			
The Gambia				X	
Ghana			X		
Guinea				X	X
Guinea-Bissau				X	X
Kenya				X	
Lesotho			X		
Liberia				X	X
Madagascar				X	X
Malawi				X	X
Mali				X	X
Mauritius		X			
Mozambique				X	
Namibia		X			
Niger				X	
Nigeria	X		X		
Rwanda				X	
São Tomé and Príncipe			X		X
Senegal			X		
Seychelles		X			
Sierra Leone				X	X
South Africa		X			
Swaziland			X		
Tanzania				X	
Togo				X	X
Uganda				X	
Zambia			X		
Zimbabwe				X	X

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