

Urban economic growth in Africa

A framework for analyzing constraints
to agglomeration

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Abstract

Urbanization is a key feature of growth and structural change in low-income countries, but African cities have left a large majority of their populations without productive jobs or adequate housing and other services. African cities are urbanizing while relatively poorer than when other developing regions began to urbanize; are fragmented, with low levels of accessibility; and have high costs relative to their level of development. As a result, these cities do not fully benefit from agglomeration and specialize primarily in the production of non-tradable goods and services. To address these issues and better generate productive jobs, African cities must improve their business environment to become competitive in global markets and better link workers to firms and firms to markets. To this end, we develop a framework detailing three primary constraints to a city's ability to benefit from agglomeration and generate productive jobs—accessibility, the business environment, and public sector governance. We describe indicators and data sources that can be used to measure each factor within the framework. We then describe how the framework and indicators can be operationalized for identifying constraints to growth and productivity in cities.

1. Introduction

Urbanization is a key feature of the structural transformation that drives economic growth in low-income economies. As countries urbanize, workers move from rural to urban areas in search of more productive and better-paid jobs. Similarly, entrepreneurs locate their firms in cities where agglomeration economies increase their productivity. The productivity gains created by scale, density, and economic interaction are substantial for cities in developed economies and may be even larger for cities in developing economies (Glaeser and Xiong 2017). These gains arise because better connected people and firms facilitate labor market pooling, savings in the transport of inputs, and technological and information spillovers (Cervero 2001).

Cities encourage connections between groups of firms through forward and backward linkages, between firms and workers, and between firms and consumers. Urban labor markets reduce search costs, giving firms a larger pool of workers to choose from; proximity also makes it easier for workers to match their skills with potential employers and to learn from each other. The productivity gains from urbanization are substantial. Doubling city size raises productivity by about 4 to 5 percent, and urban productivity rises as cities grow (Venables 2018). Cities are better places to undertake most sorts of investment, to start new businesses, and to create jobs.

City growth both contributes to and benefits from national economic growth. Cities can spur economy-wide growth in at least three ways. First, urban growth can increase investment. Higher economic density supports clusters of firms, making agglomeration economies attainable and boosting incentives for investment. Second, urban growth can facilitate the provision of affordable services, amenities, and housing, making cities livable for poor and middle-class residents, and improving the city's ability to match appropriately skilled workers with potential jobs. Third, cities are potentially important sources of economy-wide productivity growth, depending on what they produce. Cities that specialize in producing tradable goods and services—like those in East Asia—offer greater potential for productivity growth through economies of scale and knowledge spillovers than cities that focus on the production of non-traded goods and services. All three channels depend on urban density increasing as cities grow (Lall, Henderson, and Venables 2017).

Current research on city growth and its relationship to national economic growth and structural change is limited (Venables 2018). The goal of this paper is to improve our understanding of major cities' roles in national economic growth in low-income economies—mainly in Africa. To do so, we review the literature on urban development in low-income countries and use it to develop a systematic way to identify key constraints to a city's ability to act as an engine of productivity growth and structural change. Put differently, we ask what firms and workers need from cities. To establish a detailed analysis of constraints, we then develop a set of indicators and measurements to help understand how the city functions.

The paper proceeds as follows. Section 2 describes the pressing challenge of urbanization in Africa and some distinctive characteristics of African cities that limit their ability to benefit from urban agglomeration. Section 3 details a framework by which to analyze global cities, emphasizing accessibility, the business environment, and governance. It also discusses how the issue of inclusivity can be addressed in a process supplementary to the framework. Section 4 describes indicators and data sources that can be used to measure each factor within the framework. Section 5 describes how the framework and indicators can be operationalized for identifying constraints to growth and productivity in cities. This approach could be used to guide case studies to validate and adapt the framework. Section 6 concludes.

2. A focus on Africa

Projections suggest that in the next 40 years the urban population of the developing world will increase by 2 billion people. Most of this increase will take place in Asia, but the largest proportionate increase will be in Africa. In fact, the United Nations Department of Economic and Social Affairs (2018) projects that, between 2018 and 2050, seven of the world's 10 fastest urbanizing areas will be in Africa. Africa's urban population will nearly triple by 2050, adding 800 million people—the current urban population of Europe and North America combined.

While cities offer the promise of high productivity and job creation, they can fail to deliver these benefits. The recent experiences of East Asia and Africa, for example, feature very different patterns of urban development (Figures 1a-b). East Asian cities have largely succeeded in generating higher productivity, more jobs, and the housing and services that make cities livable, while African cities have left a large majority of their populations without formal sector jobs or adequate housing (Venables 2018). African cities have grown more as a result of population growth and migration due to rural stagnation, rather than pulled by the dynamism of the urban economy.

Weak growth of manufacturing and high productivity services has meant that African cities have failed to generate enough high productivity jobs to absorb the growing labor force, pushing Africa's urban workers into the informal sector (Figure 2). Estimates of the proportion of the African urban labor force working outside a registered or incorporated enterprise range as high as 80 percent. The share of workers employed in manufacturing in large Asian cities is typically 25 to 30 percent, while in African cities it is in the range of 5 to 15 percent (Venables 2018).

A city that works provides the conditions in which workers can be productive and households can live in decent surroundings. However, cities in Africa are not delivering on their promise of higher urban productivity or livability. At the same time, the growing concentration of people in African cities has not spurred corresponding increases in economic density and the benefits of agglomeration. Inadequate and unreliable power and transport reduce firm-level productivity, and—together with poor public services—raise urban costs. In contrast to Asia and Latin America, cities in Africa represent the world's most pressing urban problem.

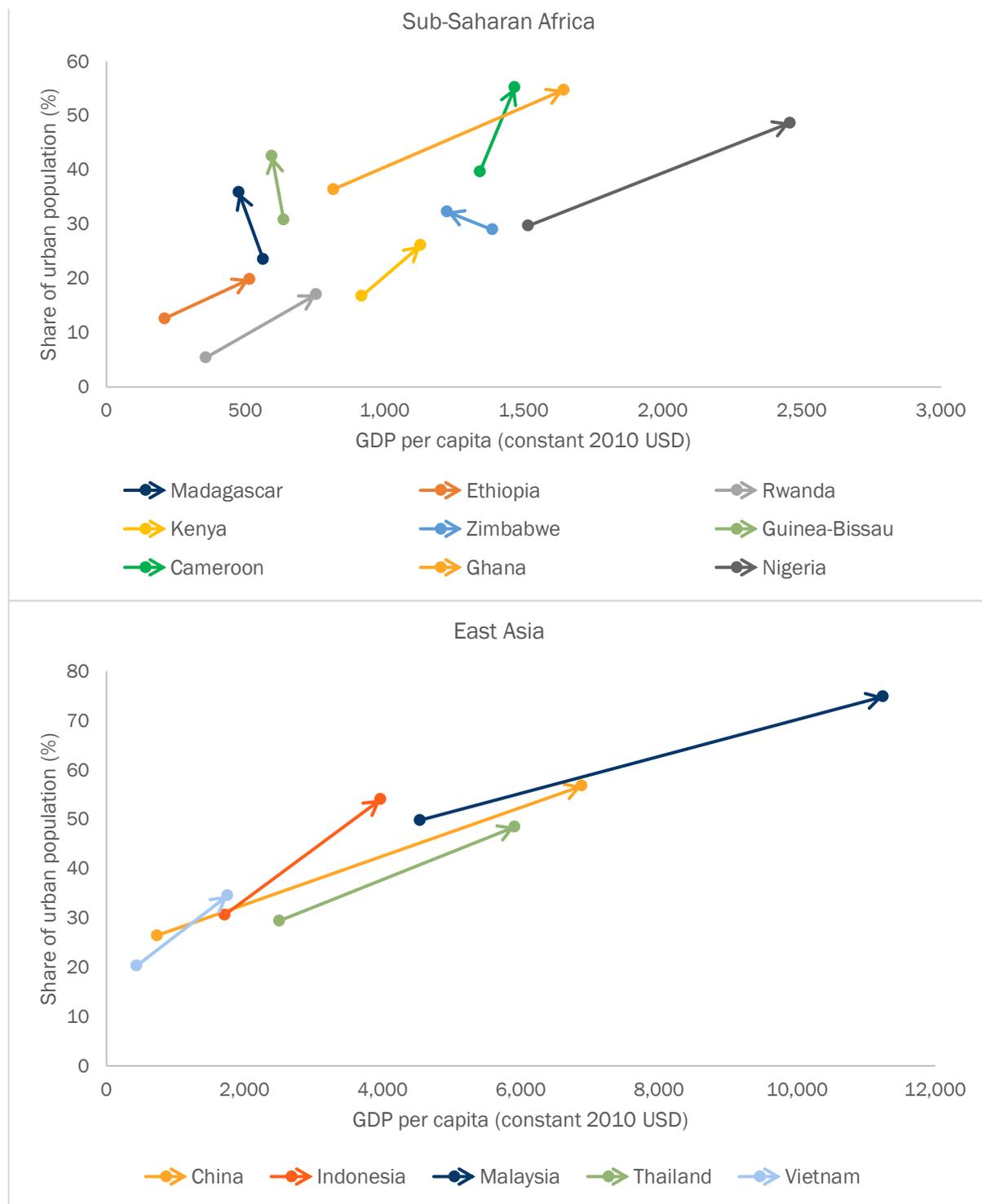
Overall, African cities have not achieved what cities elsewhere have in terms of economic growth, though we do recognize that productivity varies widely across African cities. The experience of Cape Town in generating productive jobs and participating in global markets differs dramatically from, for example, that of Accra. In addition to successful global cities, our analysis will look towards productive African cities and those with innovative practices and policies to provide examples by which less-productive African cities can grow.

2.1 The challenge for African cities

Several issues contribute to limited job creation in high productivity sectors and the livability challenges seen in sub-Saharan African cities today. First, Africa is urbanizing while it is relatively poorer than when other developing regions began to urbanize (Figure 3). In 1950, when countries in Latin America and the Caribbean reached a 40 percent urban population, their per capita GDP was \$1,860 in 2005 constant U.S. dollars. In 1968, when countries in the Middle East and North Africa region became 40 percent urban, their per capita GDP was \$1,800 (in 2005 U.S. dollars). In 1994, when countries in the East Asia and Pacific region hit the 40 percent urbanization mark, their per capita GDP averaged \$3,600. By contrast, per capita GDP in Africa is about \$1,000 (Lall, Henderson, and Venables 2017). Because per capita GDP is low, public and private investments in housing,

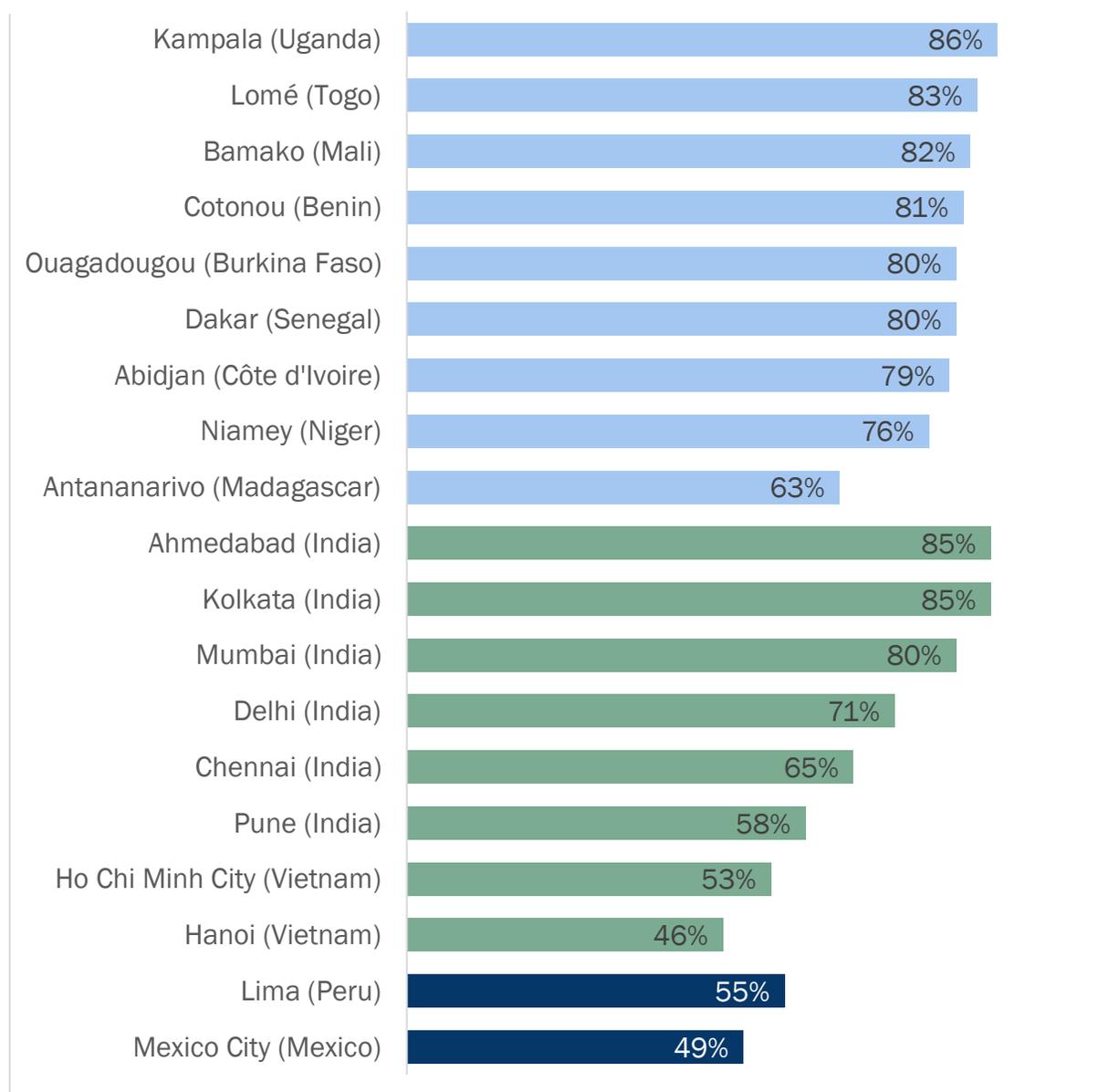
infrastructure, and other capital are lacking. Over the coming decades, Africa will need to build twice the urban capital stock that it has built over the whole of its previous history (Venables 2018).

Figures 1a-b: Urbanization and growth in East Asia and sub-Saharan Africa



Note: Calculations based on World Development Indicators. Data corresponds to changes between 1990 and 2016. Source: Hommann and Lall (2019).

Figure 2: Informal employment by city

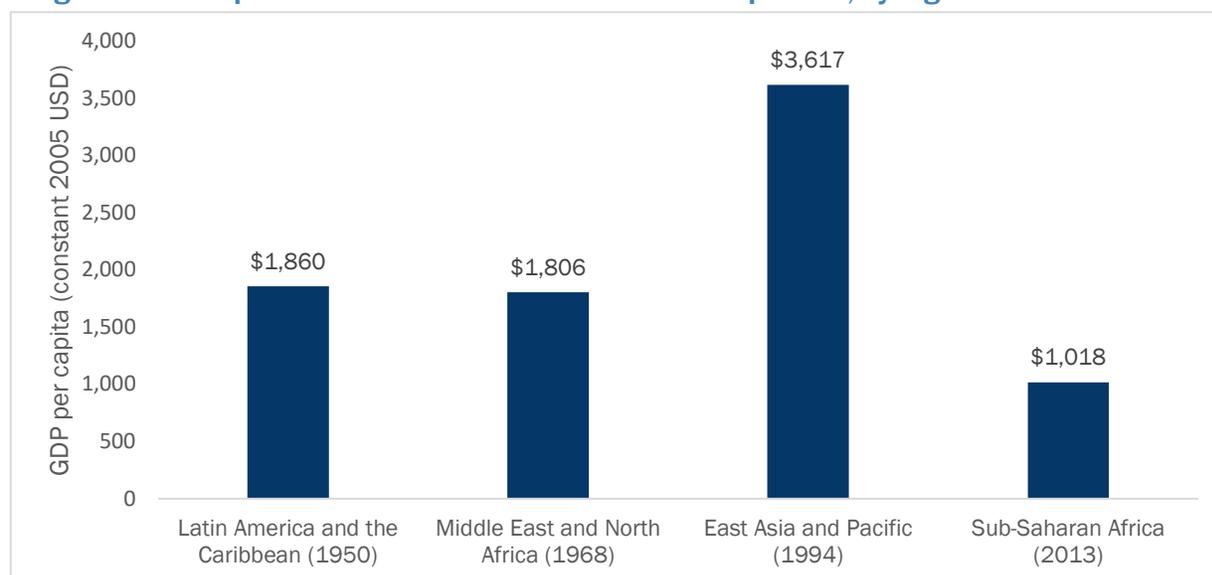


Source: Chen and Beard (2018).

Second, African cities are costly. They have high prices relative to their level of development. Data collected by the International Comparison Program indicate that urban African households pay 20 to 30 percent more for goods and services than in other developing countries (Nakamura et al. 2016). Housing and transport are especially expensive in urban Africa. Relative to their income levels, urban residents pay 55 percent more for housing in Africa than urban residents in other regions. Urban transport is about 42 percent more expensive in African cities than in cities elsewhere. Inadequate and unreliable power and transport raise costs and reduce firm-level productivity. High urban costs have an impact on wages and international competitiveness. Manufacturing firms in African cities pay higher nominal wages than firms in countries at comparable levels of development. For example, unit labor costs are 20 percent higher in Dar es Salaam, Tanzania than in Dhaka, Bangladesh. On average, African urban wages are at least 15 percent higher than wages in

comparable countries (Lall, Henderson, and Venables 2017). Using data from the World Bank's Enterprise Surveys, Gelb, Meyer, and Ramachandran (2013) compare labor costs and productivity in selected African countries relative to international comparators. They conclude that industrial labor costs are far higher in Africa than one might expect, given levels of GDP per capita. Labor costs increase more in larger and more productive firms in Africa than elsewhere. The result is that expected returns to investment in urban areas in Africa—especially in tradable goods and services—are low, relative to cities elsewhere.

Figure 3: Per capita GDP when urbanization is about 40 percent, by region



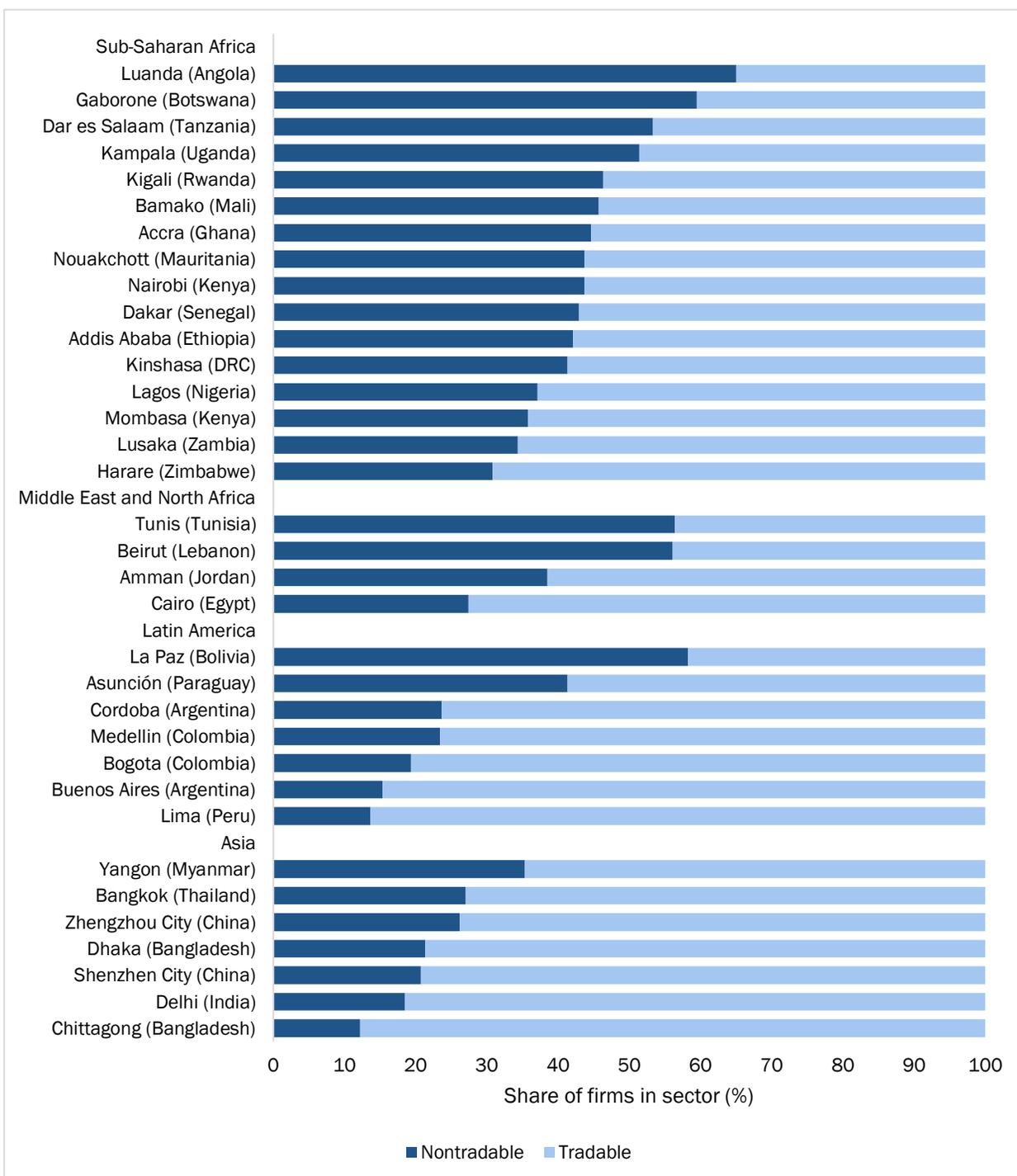
Source: Hommann and Lall (2019), from Lall, Henderson, and Venables (2017).

Third, as a result of these high costs and low returns to investment, Africa's cities primarily produce non-tradables—goods and services that are consumed locally (Figure 4). Specialization in non-tradables limits African cities' ability to contribute to two important structural characteristics—diversity and sophistication—that impact economy-wide productivity and growth. More diversified production and export structures are associated with higher incomes (Imbs and Wacziarg 2003; Cadot, Carrere, and Strauss-Kahn 2008), and countries that produce and export more sophisticated products—those that are primarily manufactured by countries at higher income levels—tend to grow faster (Hausmann, Hwang, and Rodrik 2007; UNIDO 2009). Because sophisticated products embody advanced-country firm capabilities (Sutton 2012), the ability of firms in lower-income economies to produce, and especially export, such goods indicates that those firms have mastered the technology and management practice, quality control, and value chain management required to be competitive.

Differences in diversification and sophistication are strongly correlated with differences in long-run growth in low-income countries. Notably, in Africa, the diversity and sophistication of manufacturing production has declined since 1980. There, production is concentrated in low sophistication products, and the region has exited most high sophistication industries. In contrast with the more rapidly growing low-income countries of Asia, Africa's global market shares of high sophistication exports have remained virtually unchanged over 25 years (Page 2012).

Africa's relatively abundant natural resources further compound the problem. Natural resource endowments generate relative price changes that shift factors out of agriculture and other tradable sectors into the resource sector and non-tradables. Rents generated from natural resources increase the demand for urban goods and services, including urban real estate. This added demand is met

Figure 4: Share of firms in internationally traded and non-traded sectors post-2010



Note: Calculation based on World Bank Enterprise surveys. Manufacturing, wholesale and commission trade, and business services are defined as tradable activities. Construction, local services, retail trade, health and social work, and other local activities are defined as non-tradable activities.

Source: Lall, Henderson, and Venables (2017).

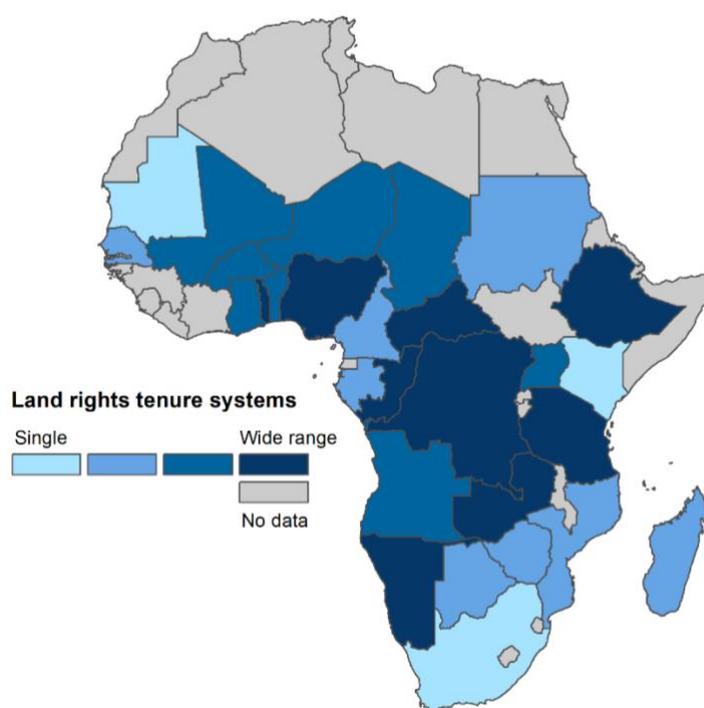
largely through imports, except for urban services and real estate. Property booms often accompany resource booms. Higher nominal wages may persist in the non-tradable sector, because firms—in the absence of competitive pressure—are able to pass increased labor costs on to consumers (Venables 2018). In the language of Gollin, Jedwab, and Vollrath (2016) urbanization in Africa’s resource-abundant economies creates these “consumption cities.”

Finally, African cities are fragmented—land use is dispersed and disconnected. The costs of housing and land give poor households in African cities two alternatives. The first is to locate in central business district slums, such as Kibera in Nairobi. These households accept lower housing standards for increased access. The second is to locate in lower cost—and often informal—slums on the periphery of the city. Around 60 percent of the African urban population lives in slums (United Nations 2015). When slums are concentrated on the periphery, fragmentation, exacerbated by African cities’ lack of infrastructure, occurs.

African cities are 23 percent more fragmented than Asian and Latin American cities (Henderson and Nigmatulina 2016). Fragmentation increases infrastructure costs and lengthens travel times. Investments in infrastructure and industrial and commercial structures have not kept pace with the growing concentration of people. Neither have investments in affordable, formal housing (Collier and Venables 2016).

Fragmentation reflects failures of land management. African cities struggle with overlapping and sometimes contradictory property rights systems — only three countries have a single urban tenure system (Figure 5). Furthermore, in Africa, land transactions are long, costly, and complicated (World Bank 2015), reducing the collateral value of structures. Unclear land rights with a wide range of tenure systems and costly land transactions severely constrain urban land redevelopment (Lall, Henderson, and Venables 2017).

Figure 5: Range of tenure systems in urban and peri-urban Africa, 2009



Source: Lall, Henderson, and Venables (2017).

2.2 Three objectives for urban policy

Africa has an opportunity to address its current urban challenge by making its existing cities more productive. In doing so, it can also enhance cities’ contribution to national economic growth and structural change. Public actions can help build more connected and productive African cities by focusing on three major objectives: generating productive jobs, linking workers to firms, and connecting firms to markets. Achieving these objectives requires making progress in three areas—accessibility, the business environment, and public sector governance.

Public sector governance pervades all of the challenges facing African cities. It determines the ability of a city to respond to the objectives of generating productive jobs, linking workers to firms, and giving firms access to markets. Governance failures often lie at the heart of the reasons why African cities fail to deliver on these objectives. Most African countries have fragmented institutional responsibilities and a complex relationship among the multiple bodies responsible for the city. In addition, in general, the fiscal capacity of most African cities is very limited. These issues reduce the ability of local governments to coordinate expectations among investors, enforce land use, and provide services and infrastructure, thus contributing to failure of urban development. We address these issues further in Section 3.

2.2.1 Generating productive jobs

The main objective of urban policy in Africa should be to encourage the growth of productive jobs in cities, which is the principal means by which Africa's cities can contribute to their own prosperity and to overall national economic growth. Productive jobs are most likely to be found in the production of tradables, whether in manufacturing or services, and in the formal sector. Because the market for tradable goods and services is not constrained by the size of the local or regional market, tradable goods and services are able to benefit from economies of scale and from the agglomeration economies that cities provide, while the size of the national economy limits growth of the market for non-tradables.

African firms face multiple obstacles to becoming competitive in global markets (Newman et al. 2016). The usual suspects are a poor "investment climate" and unreliable infrastructure, but a subtler constraint comes from the structure of the typical African city. African cities are disconnected: Their inhabitants have little opportunity to interact with each other due to a combination of factors including fragmentation, low and variable population densities, poor infrastructure, and high travel times. These constraints discourage the formation of clusters of firms. As export-oriented industries are particularly likely to locate in dense cities and to form industrial clusters (Glaeser and Xiong 2017), this failure to realize agglomeration economies and economies of scale is at the center of African cities' failure to compete.

Historically, manufacturing has been the main driver of structural change. Because it has the potential for productivity growth due to economies of scale and agglomeration, there is also evidence that manufacturing converges "unconditionally" to global best practice productivity levels (Rodrik 2013). Africa's experience with industrialization, however, has been disappointing. In 2014, the average share of manufacturing in GDP in sub-Saharan Africa was about 10 percent, unchanged from the 1970s.

Urbanization is strongly correlated with the expansion of manufacturing, except in Africa. In economies other than in Africa, the average manufacturing share of GDP rises from less than 10 percent at low levels of urbanization to nearly 15 percent when the urbanization rate reaches 60 percent. In contrast, as African economies attain 60 percent urbanization, their share of manufacturing in GDP stays flat at about 10 percent (Lall, Henderson, and Venables 2017). Gollin, Jedwab, and Vollrath (2016) term this pattern of growth "urbanization without industrialization."

In this way, structural change is taking place in Africa, but with a pattern that is distinct from the historical experience of the industrialized economies and contemporary East Asia (McMillan, Rodrik, and Verduzco-Gallo 2014). Export-led manufacturing is playing a much smaller role in the structural transformation of Africa's economies (Stiglitz 2018). At the same time, changes in transport costs and information and communications technology are shifting the boundaries of "industry," creating services and agri-businesses that share many firm characteristics with manufacturing (Newfarmer, Page, and Tarp 2018). Like manufacturing, they are tradable and have high value-added per worker.

They have the capacity for learning and productivity growth and some exhibit scale and agglomeration economies (Page 2019). These “industries without smokestacks” may offer an alternative to the leading role of manufacturing in structural change.

In addition, recent research may reshape our thinking about the role of the informal sector in creating productive jobs. The idea that small, informal firms create jobs is uncontroversial, but the contribution of these firms to productivity growth remains a subject of research. Research on informal micro, small, and medium enterprises (MSMEs) in Tanzania finds that there is significant overlap in labor productivity between “formal” and “informal” firms. Moreover, 15 percent of these informal MSMEs have labor productivity higher than economy-wide labor productivity in manufacturing. In sum, a small, but significant, share of productive firms in the informal sector— about 10 percent—coexists with a much larger number of less productive firms (McMillan, Page, and Wangwe 2016). Arthur Lewis (1979) was among the first to identify these firms, placing them in what he called the “in-between sector.” As the economy grows, these firms have the potential to grow with it.

The “in-between” sector is clearly more difficult to observe than formal sector firms engaged in producing tradable goods, and, as a result, assistance to MSMEs by government, donors, and NGOs in Africa has not successfully targeted firms with growth potential. For this reason, a pragmatic approach to promoting the growth of the “in-between” sector may be through improving access by workers to firms—allowing better matching of skills to employers—rather than through targeted programs to remove obstacles to their growth, such as financing.

2.2.2 *Linking workers to firms*

Urban labor markets expand the range of skills available to employers and facilitate better matching of skills to employers’ needs. Workers with skills specialized to a sector will be attracted to areas where employment in the sector is high, relative to the total labor force. The density of employment reduces search costs and provides a measure of insurance against unemployment. Similarly, firms will be attracted to areas where there are a large number of workers with skills relevant to their industry. Location in a large labor market also makes it easier to find specialized labor, such as designers, engineers, and consultants.

Improvements in transport infrastructure and services as well as land use are critical to linking workers to jobs. Roads and transit systems have an important impact on commuting costs and times and strongly influence labor market outcomes. Roads take up only around 10 percent of the land area of several large African cities; in a well-connected, large city this figure is generally closer to 30 percent (Collier and Venables 2017).

Reductions in transportation costs can help increase connectivity between business and residential areas, improve mobility, and reduce commuting costs (Glaeser and Kohlhase 2004). Reductions in transportation costs and gains in mobility can also foster changes in urban land use. Conversely, improvements in land use can improve workers’ access to firms without requiring investments in transportation by bringing workers and firms closer together. As African cities grow, policymakers need to plan for the growth of transportation options and land use policies that will enhance access.

2.2.3 *Connecting firms to markets*

When potential investors look at African cities, they see a fragmented and disconnected urban space (Lall, Henderson, and Venables 2017). Fragmentation limits the ability to provide public services, inhibits labor market matching, and prevents firms from reaping scale and agglomeration economies. To move out of what Venables (2018) calls the “non-tradables trap,” investments and

policies are needed to link firms to markets—ideally, the global market—through improved trade logistics.

The growth of global value chains (GVCs) has greatly increased the importance of trade logistics. Because new entrants to GVCs tend to specialize in the final stages of the value chain, poor trade logistics can make it impossible for firms to break into global value chains. In the World Bank *Enterprise Surveys*, transport trails only electrical power as the top identified constraint on firms' ability to compete. For this reason, we focus our analysis of accessibility in Section 3 not only on access of workers to firms and firms to suppliers and customers within the city, but also on access to other urban and international markets.

Value chain analysis identifies several choke points: high costs of import and export logistics, lack of timely delivery of inputs, and low speed to market (Subramanian and Matthijs 2007; Dinh, Mavridis, and Nguyen 2013). Poor logistics also constrain Africa's ability to compete in tradable services and agro-industry in particular (Newfarmer, Page, and Tarp 2018). Public policy and planning are needed, together with coordinated infrastructure investments, to improve access to international markets.

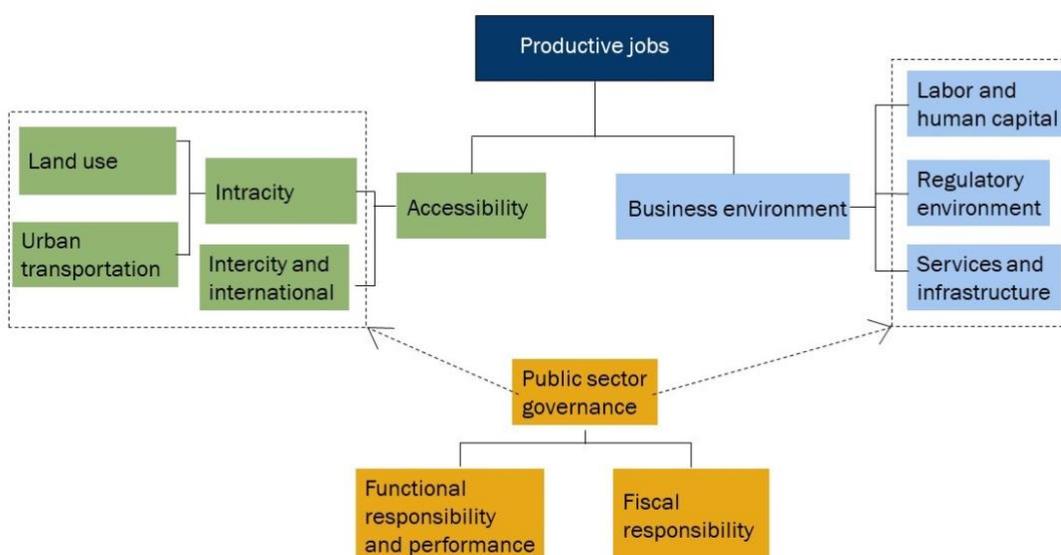
3. A framework for analysis

In Section 2, we argued that Africa faces the most pressing set of urban problems faced by low-income countries. Its cities are growing rapidly and are fragmented and disconnected. Urban costs in Africa are higher than for countries at similar levels of development, making African cities less globally competitive. Because firms are scattered, specialization is limited and few clusters of manufacturing and tradable services firms have developed. Many African cities find themselves in what Venables (2017) terms the “non-tradables trap”—specialized in producing non-traded goods and services with little ability to attract tradable production. Because of these limitations, African cities are less productive than urban areas in other regions.

As cities continue to grow in Africa and across the world, it will be vital to identify and address the constraints to their productivity growth and their ability to contribute to the diversification and sophistication of production, as well as to enhance their ability to contribute to national economic growth. This section outlines a framework for understanding the factors that may limit a city's ability to contribute to economy-wide growth.

The focus of our framework is on the city as the unit of analysis. We recognize that cities need to be seen in the context of the larger national economy and the constraints to its growth, and so distinguish between national-level issues that affect cities and are addressed through a national growth diagnostic and local-level issues that may require local or national action—the focus of our framework. The proposed analytical framework is designed as a complement to a broader national constraints assessment, which may identify urban areas that are underperforming, and focuses on issues that are particular to a given city. A country's macroeconomic environment, for example, may have profound impact on a city's ability to generate productive jobs, but is neither a city-specific issue nor one that can be addressed through urban policy.

As in Section 2, our primary objective is to identify strategies for generating productive jobs. Productive jobs are not only good for structural change, they are important for reducing poverty and inequality. Building on our analysis of why African cities often fail in creating productive jobs, we identify two first-order constraints and one second-order constraint to a city's ability to benefit from agglomeration and generate productive jobs—accessibility, the business environment, and public sector governance, respectively (Figure 6).

Figure 6: Framework for productive cities

Measures of **accessibility**—both within and between cities—help us understand how well a city connects workers to firms and firms to markets. Intracity accessibility captures how well workers and firms are connected. It has two components, transport and land use, either—or both—of which can be used to improve accessibility within a city. Intercity and international accessibility capture whether cities have access to the required physical infrastructure that can allow firms to trade both domestically and internationally.

The **business environment** is an important determinant of firms' costs, which affect firms' abilities to compete in international markets. In our framework, we focus on issues that can be addressed at the city level or jointly in conjunction with the national government. Given this consideration, we identify labor and human capital, the regulatory environment, and services and infrastructure as important components of the business environment.

Public sector governance, as applied in this framework, is a second-order constraint directed at what is required to act at either the national or sub-national level to address accessibility and business environment constraints. In this regard, the framework analyzes the distribution of fiscal and functional responsibilities between different levels of government, as well as the capability of government agencies to carry out their duties.

Our framework for analysis reflects our judgement that the most effective way to reduce poverty and inequality in Africa's cities is to create productive jobs. We recognize, however, that equitable and inclusive development represents a critical challenge for African cities. Current levels of inequality, in terms of access to housing, services, and commerce, are severe and, if not addressed, will undermine any effort at addressing the constraints described above (Pieterse 2010). Productive jobs have a role in reducing inequities, but will not fully address inequality. The framework discussed in this section, while not focused specifically on inclusivity, offers a number of opportunities to design inequality-reducing solutions to access and the business environment through the addition of distributional considerations to the analysis. For example, the measure for access to jobs can be designed to focus on low-income neighborhoods to determine possible spatial inequities between neighborhoods. In this

example, such analyses would require measures of affordability to ensure that the ultimate transport policy or investment decisions promote inclusivity.

We note that some aspects of the framework, such as land use and the regulatory environment, have cross-cutting implications. Effective use of the framework requires contextualized analysis of all the listed components of accessibility and the business environment, followed by analysis of governance as a second-order constraint.

3.1 Accessibility

Accessibility is central to the relationship between urbanization, the benefits of agglomeration, and economic growth. Conceptually, intracity accessibility is the ease of getting to and from key destinations within a city, while intercity and international accessibility refer to the ease of linking a city to outside markets.

3.1.1 Intracity accessibility

Cities, by their nature and scale, are expected to enhance access, whether it be access to employment for households or access to the labor force by employers, access to commerce for households or access to clients for businesses, or access to a wide range of economic and social services for both. Improving intracity accessibility is key to increasing labor market interactions that allow individuals to optimize their labor market decisions and firms to have the most productive people in jobs (Bertaud 2018). Optimizing labor market outcomes and connectedness leads to higher average productivity levels in cities. According to Bertaud (2018), productivity per worker is closely correlated to the average number of jobs per worker that are reachable in less than 60 minutes. Evidence from some U.S. cities shows that doubling the number of jobs accessible per worker in a 20-minute commute leads to an average 6.5 percent increase in real wages (Melo, Graham, and Brage-Ardao 2013). Increasing accessibility can also raise productivity, leading to stronger economic growth.

Low levels of accessibility can have a significant impact on firm competitiveness. Firms may have to compensate skilled workers for higher commuting costs, which can lower productivity gains for firms and raise average wages, making those firms uncompetitive in international markets (Avner and Lall 2016).

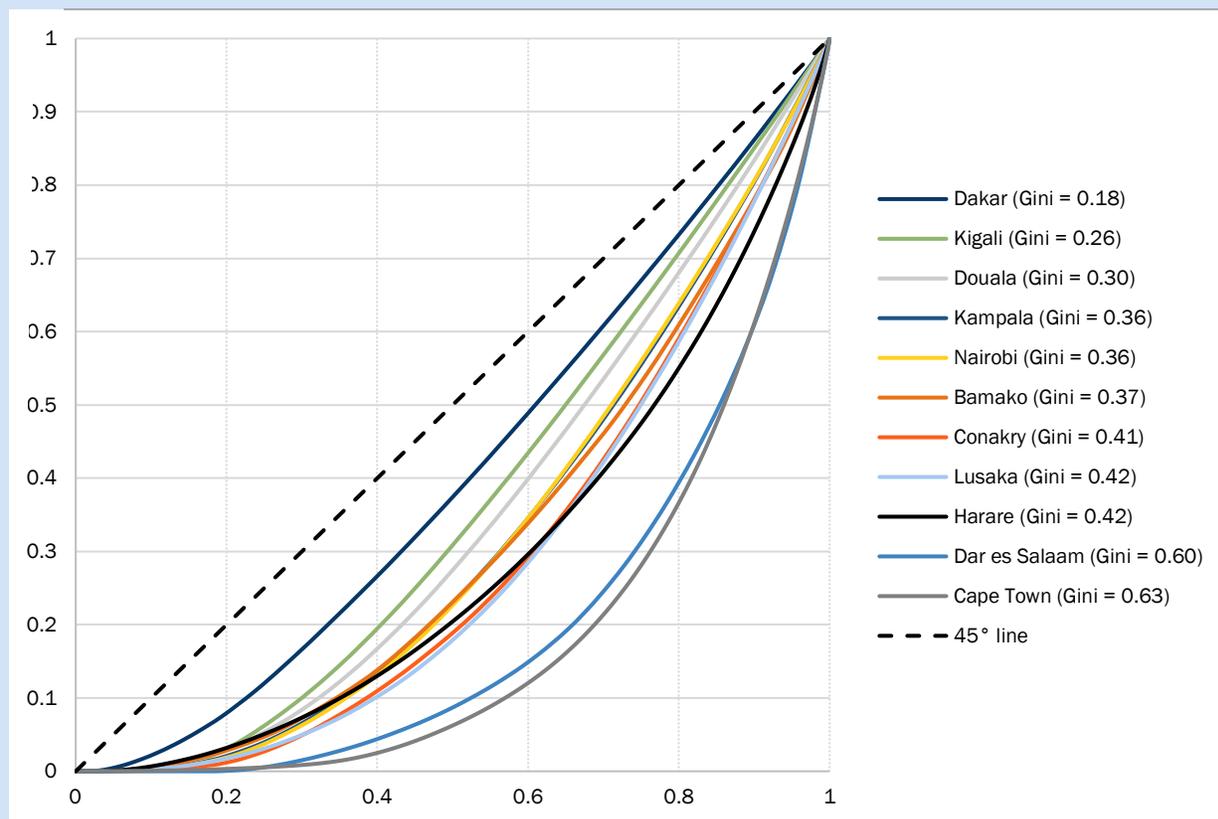
Traditionally, attempts to address intracity accessibility have focused on transportation and the flow of traffic in terms of congestion and speed. As we note in Section 2, while transportation-related issues represent one aspect of accessibility, referred to as “mobility,” recent work has also recognized that land use is an important second aspect (Venter 2016). Access can be improved by changing land use and the location of employment centers, households, commerce, or services without changing mobility. Cities can have high congestion but also high accessibility if they have, for example, high densities or mixed land uses. Accessibility can thus be improved by addressing either of these two factors: improving land use to bring people and firms closer to each other, or improving transport infrastructure to increase mobility (see Box 1).

Box 1: Measurements of intracity accessibility

There is no established global standard for measuring accessibility, nor is there one single measure that captures all dimensions of accessibility (Gutman et al. 2017). The most widely-used accessibility measurements are location-based; these measures typically count the number of opportunities that are reachable within a given amount of time or distance, and can incorporate different transportation modes and cost structures. They are also able to compare levels of accessibility between neighborhoods or other geo-located features. Other measures include those that are infrastructure-based, and analyze the performance of transport infrastructure and services; and those that are person- or utility-based, and consider accessibility at the level of individuals or characteristic groups (Gutman et al. 2017).

Recent research from Peralta Quiros, Kerzhner, and Avner (2019) uses a location-based measure of accessibility to analyze access to formal employment opportunities by public transportation in several African cities. This process produces localized estimates of accessibility, allowing for calculation of Lorenz curves and Gini coefficients of the distribution of access across the city (Figure B.1). Combining measurements that include all relevant disciplines, including transportation, land use, and governance, and that analyze the distribution of access can provide a more complete picture of a city’s accessibility.

Figure B.1: Lorenz curve for accessibility



Source: Peralta Quiros, Kerzhner, and Avner (2019).

3.1.1.1 Land use

Land use patterns and the various factors that affect them—including the formalization of land ownership, development, or use and related transactions—can either facilitate or hinder accessibility. When, for example, the locations of households and firms are disjointed or fragmented, accessibility is constrained. Lack of planning, inappropriate land use regulations, unclear land rights, conflicts between informal and formal markets, and legacy issues all can contribute to fragmentation, especially when land use is disconnected from transport infrastructure and services. While fragmentation is a worldwide challenge, in African cities, as discussed in Section 2, it is a fundamental issue.

The lack of clarity in land rights contributes significantly to these patterns in Africa. Prerequisite for functioning land use is the existence of an effective land titling system in which formal property rights are assigned to land owners. Weaknesses in the formal land market impede changes of land use and ownership; for instance, in countries with weak land titling systems, firms cannot buy land from low-density residential use to convert into higher-density residences or create new commercial structures (Collier 2017). These impediments may lower accessibility, particularly when they result in a disconnect between all or some of the locations of housing, jobs, amenities, and transport systems.

Accessibility and the issue of land markets are also closely related to housing. Housing costs underlie much of land use fragmentation: As households try to reduce their housing costs, they sacrifice quality and space by locating in central urban slums, or move to the urban periphery where low-cost land is available. Informal land markets are used as a means to avoid the high costs of formal markets, inadequate legal frameworks, and inappropriate regulations. Ineffective or unmanaged land markets then lead to distortions in the location of housing.

As indicated in Section 2, African households generally pay more of their income for housing and transport than people in other regions; as a result, the percentage of urban populations living in slums is the highest in the world. Furthermore, in many developing- (and developed-) country cities, the development of new and affordable housing at the periphery of cities pushes residents to locate far from centers of employment and public transport routes (see Peralta Quiros and Mehndiratta 2015). Taken together with the higher costs of transport, the location of housing translates into a crucial constraint to accessibility.

The construction of new housing, firms, and infrastructure can also be constrained by the location and stock of developable land, which is a major determinant of the future growth pattern of a city. Closely tied to developable land is the issue of availability of publicly owned land and the appropriability of land—the process by which land becomes the property of a person or group of persons, and the ability of market and land administration systems to efficiently and inclusively mobilize land, including to consolidate and aggregate land parcels. If land is not available for public or private development, or if available land is located away from transport infrastructure or current employment centers, the locations of housing, firms, and transport infrastructure may become misaligned, constraining accessibility.

Land use can also impact and be impacted by urban vulnerability, or the threat that cities face from environmental events such as flooding, droughts, and earthquakes. Urban vulnerability must be taken into account when considering the stock of developable land, for example, or a city's future growth potential. Costs of vulnerability are often unevenly distributed among the urban population: Most often, the poorest live in the most vulnerable areas near flood plains and steep slopes, placing them at an increased risk during extreme weather events (World Bank 2013). By destroying or damaging the households of those living in vulnerable areas and limiting their access to public infrastructure and services, environmental vulnerability also results in lower levels of investment in land and decreases productivity. As more than 26 million people in sub-Saharan Africa are expected to live in low-elevation

coastal zones by 2030, it will be vital to address cities' environmental vulnerability to ensure growth (Hommann and Lall 2019).

Effective land policies are vital for improving accessibility, ensuring sustainable urban migration, reducing vulnerability to climate change and environmental risks, lowering inequality, and enabling economic growth in developing countries; land use is thus among the most critical factors that limit the accessibility, growth, and livability of urban areas. The objective of analyzing land use is not to promote any particular pattern of land use nor any specific density (see Angel 2017 and Bertaud 2018), but rather to understand how land contributes to the accessibility of a city, both in and of itself and in conjunction with transport systems. Ultimately, solutions targeting land use to improve accessibility should be judged on the basis of practical viability and estimated costs and benefits.

3.1.1.2 Urban transportation

Urban transportation refers to the availability and reliability of transport infrastructure and services within a city. Strong transport infrastructure supports an economic environment in which the potential of cities from scale, specialization, and agglomeration economies can be achieved, and enables cities to achieve connectivity so that firms are better able to communicate and learn from each other and workers can find employment in jobs that match their skills (Collier and Venables 2016). Insufficient transport infrastructure, conversely, disconnects people from other people and from jobs, services, and amenities (Hommann and Lall 2019).

As we discuss in Section 2, improvements in transport infrastructure and services are critical for linking workers to jobs. In developing-country cities, transport is costly and time consuming, limiting the city's ability to match workers with jobs. As cities grow, policymakers need to plan for the growth of transportation options that will enhance urban mobility. Roads, transit systems, and transportation services have an important impact on commuting costs and times and strongly influence labor market outcomes. Evidence shows that a reduction in transportation costs—brought about, for example, by road or public transportation investments—can help increase connectivity between business and residential areas, improve mobility, and reduce commuting costs (Glaeser and Kohlhase 2004). Reductions in transportation costs and gains in mobility can also foster changes in urban land use and economic growth.

Urban transportation issues intersect with land management: Without some control of land management, cities tend to develop diffusely, requiring more infrastructure. Diffuse, multipolar cities, such as Atlanta, require more extensive and costly transportation networks than more monocentric cities, such as Barcelona, to offer the same level of transport services for their citizens (Bertaud 2003). The combination of weak land management with income and revenue constraints of developing-country cities, then, makes transport infrastructure solutions problematic. Indicators for African cities illustrate this issue, showing a lack of infrastructure beyond the central core compared with developed-country cities (Lall, Henderson, and Venables 2017).

Thus, in many developing-country cities, there is thus a need to finance transport infrastructure and services to promote urban agglomeration effects in terms of efficiency and connectivity while making urban settlements environmentally sustainable (Hommann and Lall 2019). Coordinated, early investment in infrastructure and transport services can also set cities onto a more efficient development path, since there is often interdependence among building sites, structures, roads, and other transport infrastructure (Lall, Henderson, and Venables 2017).

The provision of transport infrastructure traditionally focuses on the extent and quality of the street network. Transport planners tend to concentrate on the quality of mobility—the level of congestion and average speed on major urban routes—to guide investments in transport services (Venter 2016), as

an increase in speed and reduction of travel times on major urban routes expands the labor market and improves access to jobs. A more robust analysis, however, requires an assessment of all transport services that utilize a city's infrastructure, including individual cars, public transport (bus or rail), motorbikes, and non-motorized alternatives (bicycling or walking).

In Africa and other developing countries, forms of transportation other than cars and formal public transport are often frequently utilized. The prevalence of motorbikes and non-motorized options in Africa, for example, reflects high levels of congestion on roads, the high cost of private and public transport, and the location of lower and moderate-income households at the periphery of cities. The substantial market for informal transport services, including buses, taxis, and motorbikes, that operate outside the regulated system further complicates transport systems (Zegras and Gakenheimer 2006). Although criticized for operating outside public regulatory policies, these services respond to unmet demand for transportation, and play an important transport function. Due to these complexities, identifying constraints and developing appropriate responses requires the analysis of a wide range of interactive variables including infrastructure, formal and informal services, pricing, and land use.

3.1.2 Intercity and international accessibility

A city's interurban and international connectedness as well as the cost of transport is important for growth given the central role of international trade for countries to effectively participate in and benefit from the global economy. Cities with strong domestic transport links, such as road networks and freight services, have better and less costly access to the inputs necessary for manufacturing and other tradable industries. Cities with better international transport links are better positioned to tap into global markets.

Global trade has expanded rapidly over the last several decades, growing faster than GDP growth for the most of that period (WTO 2007). The East Asian growth "miracle," for example, was characterized by integration into global manufacturing value chains that drove rapid increases in output and employment in the urban manufacturing sector. Value chain analysis identifies several important choke points that may prevent African countries from growing through trade—high costs of import and export logistics, lack of timely delivery of inputs, and low speed to market (Subramanian and Matthijs 2007; Dinh et al. 2012). Poor logistics also constrain African cities' ability to compete in tradable services and agro-industry (Newfarmer, Page, and Tarp 2018).

In many low-income countries, transport infrastructure is inadequate. In sub-Saharan Africa, poor road networks and port quality are cited as major obstacles to growth and barriers to doing business (Collier and Venables 2016). According to one estimate, trade costs in Africa are 50 percent higher and volumes are 30 to 60 percent lower for landlocked regions (Behar and Venables 2011). Economic activities are disconnected from each other and from global markets. Transport infrastructure investment requirements for the region are estimated to be very large, at around 5 percent of GDP per annum (Collier and Venables 2016). Public policy and planning are needed, together with coordinated infrastructure investments, to improve access to international markets.

3.2 Business environment

A city's business environment is a key determinant of costs for existing firms and an important variable in locational choice for potential new market entrants. The business environment is composed of factors including labor availability, costs, and skills; access to finance; the regulatory environment; and adequacy of basic services such as power, water, high-speed internet, and schools. If any of these factors are lacking or poorly supplied, costs for firms can increase, affecting their ability to compete in international markets. Thus, in addition to improving accessibility, urban investments and policies to improve the business environment are needed to allow firms to compete on the global market.

The business environment includes factors that may be determined by and addressed with policies at the local level, national level, or a combination of the two. For example, while access to credit is often a significant constraint for small and medium enterprises, most regulations under which banks and financial institutions operate are created at the national level. In contrast, labor regulations are frequently defined through both local and national policies. As our city-level framework is complementary to the national diagnostic, we focus on factors that can be addressed by local governments or in collaboration with the national government.

3.2.1 Labor and human capital

A key feature of large urban labor markets is that they lead to better job matching between people and firms, thus supporting increased specialization (Quigley 2009). Better job matching can raise firm productivity, thus lowering costs and increasing firms' competitiveness on the international market. However, this result is dependent on the availability of an adequately trained workforce. Nearly 60 percent of African 15- to 24-year-olds have only completed primary school and only 19 percent have studied beyond lower-secondary (Filmer and Fox 2014). Educational quality is an issue at all levels. Learning assessments show that most primary students in Africa lack basic proficiency in reading at the end of second or third grade. Employer surveys report that African tertiary graduates are weak in problem solving, business understanding, computer use, and communication skills (World Bank 2007; Filmer and Fox 2014).

Lack of skilled labor can slow growth and limit a firm's ability to benefit from economies of scale. Workers' skills are a significant challenge for larger firms and firms in more technologically-advanced sectors. In Africa, larger firms and those looking to expand cite labor skills as a significant challenge more often than smaller firms (Gelb et al. 2008, Hallward-Driemeier and Aterido 2009). IT-enabled services can be constrained by the lack of university graduates with relevant software development, project management, and language skills. (Ngui and Kimuyu 2018). The skills needed to interact with tourists and to provide the many "back office" services that are inputs into the production of high-quality tourism are essential to further development of the tourism industry (Daly and Gereffi 2019).

Cities with higher aggregate human capital (usually measured by mean or median years of schooling) have higher average productivity. In addition, there is some evidence to show that cities with higher levels of aggregate human capital benefit more from knowledge spillovers (Abel, Dey, and Gabe 2011). Complementarities between human and physical capital can also induce firms to invest more in physical capital in cities with high levels of human capital.

3.2.2 Regulatory environment

The regulatory business environment of cities—including the ease of entry and exit for firms, tax policies, and labor regulations, among other aspects—is important for both new and existing firms. In many cities, the regulatory environment is comprised of a combination of national and local laws. These laws affect a number of firm-level decisions including entry, growth, and export. For example, countries with regulations that restrict firm entry experience slower productivity growth in naturally "high entry" industries (Klapper, Laeven, and Rajan 2004). New firms consider the regulatory environment of an urban area when making choices on where to locate or expand operations. A poor regulatory environment can prevent firms from entering a city, and, for existing firms, a weak or ineffective local regulatory environment can be an impediment to growth and increase costs, reducing competitiveness in global markets.

The ease of entry and exit for firms, tax laws, and labor regulations present different challenges for firms and for cities. Time consuming and expensive firm registration processes, for example, are associated with larger informal sectors (Djankov et al. 2002). Regulatory processes that result in large

informal sectors have a potential long-term effect on city productivity since, as noted in Section 2, the majority of informal firms are less likely to grow and tend to operate at lower productivity levels. There is some evidence to suggest that in countries with more restrictive labor regulations, fewer firms choose to export, and those that do incur higher costs and export less intensively (Seker 2010).

As discussed in Section 2, a small share of informal firms operating in the “in between” sector exhibit high levels of productivity and potential for growth. Similarly, looking at informal firms in West Africa, Benjamin and Mbaye (2010) find that the productivity gap between large informal firms and the formal sector is small. It is also important to address the regulatory constraints facing these high-productivity informal sector firms, which may differ from those facing formal sector firms.

3.2.3 Services and infrastructure

Urban services and infrastructure, excluding transport, refer to the availability and reliability of piped water, sanitation and drainage networks, grid electricity, solid waste collection, and policing. Strong urban infrastructure and services are essential for facilitating economic growth and trade by helping firms lower costs and increase productivity.

Infrastructure investments can increase potential economic growth by promoting capital accumulation and higher productivity (World Bank 2015). They can also play an important role in coordinating expectations about future development, thus helping cities overcome coordination failures that may prevent investment (Collier and Venables 2016). Insufficient infrastructure, conversely, can lead to crowdedness, pollution, flooding, and overconsumption of resources (Hommann and Lall 2019). Poor infrastructure also raises the cost of doing business in a city both directly and indirectly by increasing urban areas’ costs of living and thus nominal wages, which reduces the competitiveness of firms on the global market.

Both access and reliability of power supply have a significant impact on firm operations. Electricity shortages limit entrepreneurial activity, reduce output, lower productivity, and limit export competitiveness (Mensah 2018). These factors, in turn, impact job creation. A systematic review applying the Hausmann-Rodrik-Velasco (2005) binding constraints framework to electricity supply and economic growth found that 40 percent of 55 studies determined electricity to be a binding constraint to growth (McCulloch and Zileviciute 2016).

Similar to electricity, internet access is becoming an increasingly crucial component for firm competitiveness, especially in value chains that require highly coordinated logistics, such as clothing or horticulture. High speed data transmission is critical to exporting a wide range of services, especially to information and communications technology (ICT)-intensive exports (Frischtak 2018). In call centers, information technology plays a key role in customer service and sales. Information technology also plays a significant role in the tourism industry. Reliable internet allows firms to access international markets and can lead to increased productivity through learning.

Hjort and Poulsen (2019) find that the arrival of high-speed internet cables in Africa led to an increase in the employment rate due to increased firm entry in sectors that benefit from ICTs, increased productivity in existing manufacturing firms, and an increase in exports. A broader firm-level study covering 117 developing and emerging countries also finds that internet adoption increases firm productivity. The productivity benefits are positive but lower for firms that face constraints such as power outages, corruption, and limited access to finance (Paunov and Rollo 2015).

To date, the countries most successful at sustaining high growth have supported their cities with investments to improve urban infrastructure in order to accommodate rapid population growth in major economic centers (Alm 2015). In most low-income cities, however, infrastructure and services

are severely inadequate, reflecting a failure in both public and private provision as well as the inability of capital investment to keep pace with urban population growth. Furthermore, while urban residents are, on average, better-off than those in rural areas, inequality in access to services is on the rise, and many municipal services are not accessible in informal settlements and slums (Hommann and Lall 2019).

3.3 Public sector governance

The issue of governance is a pervasive subtext of the elements discussed above. The ability to respond to each of the above factors depends on capable institutions and clearly delineated institutional responsibilities, underscoring the importance of governance and public sector governance in particular. For the purposes of this paper, we focus on the clarity by which government responsibilities are set forth and whether government can effectively and efficiently fulfill its role.

Public sector governance matters because successful urban development depends on meeting expectations, whether it be those of the private entrepreneur or the urban migrant. The interplay between governance and expectations is illustrated by the failure of cities in Africa to develop the agglomerations vital to the production of tradable goods and services. For example, governments can foster agglomeration by concentrating investments in high-quality institutions and infrastructure in a limited geographical area, such as a special economic zone (SEZ) (UNIDO 2009; Farole 2011). Africa's experience with spatial industrial policy, however, has been largely disappointing (Newman and Page 2017). Much of the problem derives from a lack of coordination between SEZs and the local and national organizations that control public services and institutions outside the zones (Farole 2011).

Clearly, strong and reliable public authorities are essential to delivering critical public infrastructure and services, ensuring the protection of private property rights, and pursuing fair and equitable regulatory and fiscal policy. As a result, as accessibility and business environment constraints are identified, there arises a second level of constraints regarding governance that must be assessed in order to determine the most viable response to these first-order constraints.

To assess the issue of governance, it is essential to evaluate the distribution of functional and fiscal responsibilities between central, regional, metropolitan, and local governments and other institutions, such as state enterprises. What level of government is responsible for urban services such as transport, land management, and regulatory policy? How effective are these institutions as they relate to the issues raised above? Is there clear accountability?

Moreover, there is the question of fiscal capacity to address constraints requiring intensive capital input. Does urban finance represent a further constraint to public sector response?

3.3.1 Functional responsibility and performance

In the economics literature, it is widely held that increasing functional decentralization and linking the responsibility of government services with the people who are supposed to benefit from those services improves efficiency and leads to long-term economic growth (Oates 1972). The efficiency gains accrue from local governments having better information about citizen preferences given their physical and institutional proximity. Greater efficiency may also occur due to the relative ease of holding local, as opposed to national, governments accountable (Boadway, Roberts, and Shah 1994; Martinez-Vazquez and McNab 2003).

In practice, the optimal decentralization of functions is not completely straightforward (Bahl 2013). When functions are distinctly local, such as land management, housing, sanitation, and urban transport, local responsibility makes sense (Cartwright et al. 2018). When functions cross the

boundaries of any single municipality, such as water basin management, national power grids, and intercity transportation, or require extensive financing and logistical support, such as major urban infrastructure projects, responsibility should rest with a higher order level of government—and in Africa, often belongs to the national government. Larger cities most often encompass multiple municipalities, as growth spills beyond historical boundaries. Metropolitan governance represents an increasing challenge worldwide, and its improvement is a good opportunity for many African cities where local decentralization is still in its formative stage.

The search for optimal allocation is further complicated by the various types of decentralization: “administrative decentralization,” where responsibilities are delegated from central to local government but accountability to the central level is retained; “devolution,” where responsibilities and accountability are fully transferred to the local level; and “deconcentration,” where responsibilities are “dispersed” to extensions of central authority (UCLG 2015). Issues of institutional capacity also drive the decision regarding type and pace of decentralization.

Experience worldwide illustrates the diversity of approaches to the distribution of government functions: Even among OECD countries, there is wide divergence. The U.S. is highly decentralized to local municipalities, whereas many European countries remain substantively “top-down” in their allocation of functions or more dependent on regional authorities. Much of this is due to how government structures evolved throughout the course of history (Soulage, Conroy, and Sow 2017). Different approaches to decentralization can all be effective; overall, it is most important to ensure clarity of roles and responsibilities for specific functions by level of government and the assurance of accountability.

With functional responsibility defined, the next level of analysis relates to the performance of government agencies. Each of the key elements of our framework—the business environment, land use, and transportation—raise different types of issues. In the case of land, key areas of concern include the formalization of land rights, the quality and fairness of land rights enforcement, the effectiveness of land use planning and its effect on market forces, the management of public lands, and the ability of the government to acquire necessary property, such as for rights-of-way (see Box 2). In the case of urban transport, key issues include the effective planning and management of public infrastructure, the efficient operation of public transport services, and the adequacy of regulatory (operational and financial) policies to facilitate a broad range of services both public and private. The performance of government agencies in these areas may constrain or enable any potential solutions.

3.3.2 Fiscal responsibility

The other crucial public sector governance constraint is fiscal limitations that may restrict options to respond to identified issues. In general, the fiscal capacity of most African cities is very limited. They are unable to finance their infrastructure needs through own-source revenue or borrowing. Developing countries, and those in Africa in particular, remain highly centralized in terms of revenue generation and budgetary allocation (Smoke 2013). Local authorities are mainly dependent on transfers from the national government for funding, which can fluctuate from year to year without a clear framework for allocations. Furthermore, in numerous countries, there is a significant imbalance between the level of functional responsibility and the level of fiscal responsibility (United Nations Conference on Housing and Sustainable Urban Development 2017). It is difficult to maintain service accountability when the local government does not also have control over fiscal resources.

Box 2: Measuring land management

Land management—the governance of land—takes place through land titling (the assignment of formal property rights to land owners), zoning (the division of land into areas in which certain land uses are permitted or prohibited), and decisionmaking on the use of government-owned land. To realize agglomeration effects from efficient urban land use and for cities to become dense, efficient, and productive, land rights must be formal, readily transferrable, and subject to consolidation as far as is consistent with optimal zoning (Hommann and Lall 2019). Most developing countries, particularly in sub-Saharan Africa, need to improve land management by strengthening institutions to allow for better land use planning, a modernized land administration system, and easier and more transparent transactions (Hommann and Lall 2019). In Africa, systems of property law and land ownership are often the first and most cumbersome regulatory burden weighing on urban development (Lall, Henderson, and Venables 2017); for example, it takes twice as long and costs twice as much to transfer land in sub-Saharan Africa as in OECD countries.

Weaknesses in the formal land market impede changes of land use and ownership; for instance, in countries with weak land titling systems, firms cannot buy land from low-density residential use to convert into higher-density residences or create new commercial structures (Collier 2017). Inappropriate or nonexistent land zoning can reduce the efficiency and sustainability of cities; appropriate land zoning is important to ensure effective land use and to provide infrastructure and public services, improve the urban environment, prevent pollution, and pursue sustainable development (Byamugisha 2013). Ineffective management of public land can also reduce accessibility by, for example, limiting options for construction of transport infrastructure. By lowering density, decreasing investment, and reducing the efficacy of land use, weak land management therefore inhibits accessibility and decreases the productivity of urban areas.

Measuring the performance of relevant agencies in enacting and enforcing effective land management policies can be difficult. The ideal measurements of land management include direct indicators for the existence, efficacy, and enforcement of related laws and policies. For titling, these ideal measurements can be approximated through the use of indicators detailing the difficulty of registering property and perceptions of tenure insecurity; additional consultation with stakeholders may be necessary to determine whether failures of titling exist due to inappropriate laws or due to ineffective enforcement. For zoning, measuring the efficacy of land use regulations is both difficult and subjective, as no single “best” zoning plan exists; this issue also applies to the management of government-owned land, for which there may be no one “best” use. As a result, qualitative methodologies, including consultation with key stakeholders, may be necessary to collect data on perceptions of the efficacy of zoning plans and levels of enforcement within a city, and on the effective use of government-owned land.

As countries and cities increasingly realize their potential for substantial local revenue raising, especially through land-based taxes and fees, there will be a need to rebalance national and local revenue-raising options. This is not to say that national transfers should or could be eliminated; it is clear that the infrastructure gap, for example, outstrips the potential of local resource mobilization. Rather, rebalancing would improve the linkage between the beneficiaries of local expenditures and government accountability and would allow national governments to use transfers in a more strategic manner, such as to incentivize local governments to fulfill minimum service levels or to direct revenues to poorer localities. Additionally, increasing local revenues would allow for more consistency in year-to-year budget levels and mitigate the influence of political dynamics between local and national administrations.

4. Indicators

In order to determine binding constraints to productivity growth, relevant measures and indicators are needed to analyze the factors encompassed within the framework. Based on the discussion above, the factors are organized according to four overarching categories:

1. Productive jobs: The performance of cities in the production of tradables;
2. Accessibility: The ease of reaching key destinations within or outside a city, including:
 - Intracity accessibility, composed of two key factors:
 - Land use: The effective formalization of land ownership, development, or use and related transactions; the cost and location of housing; the location and stock of developable land; and the extent of risk to urban property due to floods or other natural disasters;
 - Transport infrastructure: The availability of transport infrastructure and related services;
 - Intercity and international accessibility: The availability of transport infrastructure and services between cities and to international markets;
3. Business environment: The availability of major business inputs required for international competitiveness and productivity, including:
 - Labor and human capital: The availability of a large urban labor market with effective job matching, competitive wages, and appropriate skills and knowledge;
 - Regulatory environment: The ease of entry and exit for firms, tax policies, and labor regulations;
 - Services and infrastructure: The availability and reliability of services other than transportation such as electricity, piped water, schools, and health care;
4. Public sector governance: The allocation and effectiveness of responsibility for public services and fiscal authority and the capacity of government agencies, including:
 - Functional responsibility and performance: Roles and responsibilities for specific functions by level of government, assurance of accountability, and capacity of relevant agencies to undertake their responsibilities;
 - Fiscal responsibility: The ability to finance needs through own-source revenue or borrowing, and the consistency of year-to-year budget levels.

To the extent feasible, indicators for the main categories and sub-categories have been identified that are available from publicly accessible data sources across a range of cities worldwide. In some cases, however, there are no current data sources or internationally accepted norms. Potential measures are proposed and can be calculated for targeted countries.

The ultimate intention is that a diagnostic for a specific city or set of cities would have sufficient evidence on the range of factors influencing the potential benefits of urban agglomeration. Any application, however, clearly requires a detailed understanding of the political, economic, and social context of the subject cities.

4.1 Productive jobs

A city's economic success is determined by its ability to create productive jobs, which is closely tied to its production of tradables. Measuring a city's distribution of output between tradable and non-tradable sectors can therefore allow for identification of underperforming cities. We focus on the production of tradables because, due to the very low productivity of rural areas in many developing countries, cities may have high productivity relative to national levels, even if they are underperforming relative to the frontier. One reason for underperformance is high costs, which reduce the net benefits

of agglomeration in cities and lower cities' global competitiveness, resulting in specialization in the production of non-tradables and generation of relatively few productive jobs. We follow the methodology used by Lall, Henderson, and Venables (2017) to identify cities with a high concentration of firms in the non-tradable sectors.

Indicator	Data source	Level of detail (city/national)	Notes
Distribution of firms in tradable vs non-tradable sector	World Bank Enterprise Surveys	City	Use sector classifications as set out by Lall, Henderson, and Venables (2017)

4.2 Accessibility

Measuring the relative level of accessibility in a city is difficult. Presently, there is no major international database of accessibility, nor is there an accepted international standard. Recent efforts, however, have focused on a combination of land use and transport, primarily measuring the level of employment within a given commute of a neighborhood or the level of population within a given commute to an employment center. Besides the challenge of available data, especially regarding employment, the various approaches to measurement make it challenging to adopt an average accessibility indicator for a city. A city represents a combination of neighborhoods, some that have high accessibility, such as those near central business districts, and others that have relatively poor accessibility, such as peripheral poor neighborhoods. The underlying premise is that in large, integrated labor markets, all workers should have access to all jobs (Angel 2017).

The following indicators measure both the level and distribution of accessibility within a city. These indicators are intended solely to determine whether accessibility is a constraint to a city's ability to capitalize on agglomeration economies; they are not intended to prescribe a solution. Rather, if the level or distribution of accessibility is relatively low in a city, further examination into the city's land use and transportation systems and into the feasibility of improving either or both of these two components is required.

Indicator	Data source	Level of detail (city/national)	Notes
Percentage of formal employment in a city available within a public transport commute of one hour	Peralta Quiros, Avner, and Kerzhner (2019)	City	Limited data availability; methodology to be applied to pilot cities "Public transport" includes informal methods of transport such as motorcycle taxis and minibuses
Distribution of accessibility across neighborhoods	Peralta Quiros, Avner, and Kerzhner (2019)	City	Limited data availability; methodology to be applied to pilot cities

4.2.1 Intracity accessibility: Land use

Measurements of land use fall into four categories: land titling, housing and employment, developable land, and urban vulnerability. Titling measures the existence and efficacy of laws regarding the

assignment and transfer of formal property rights to land owners. Housing and employment measure the cost and location of new housing; the location of new employment centers; and the alignment among the locations of housing, firms, and transportation infrastructure. Developable land measures the existence and location of land that is available for development, indicating potential constraints on the future growth patterns of a city. Finally, vulnerability measures the threat that cities and firms within cities face from environmental events such as flooding, droughts, and earthquakes, indicating the potential costs of climate-related events and the necessity of plans to mitigate their effects.

The issues of housing location as well as affordability are often major constraints to integrated labor markets. To measure housing location’s impact on accessibility, a relevant indicator is whether the location of new housing is in neighborhoods with good accessibility in terms of transport and employment centers. For pricing, the ideal indicator would measure housing prices by neighborhood; to approximate this indicator, we include an indicator for the cost of housing as a percent of income.

Similarly, the ideal measurement of developable land would include comprehensive data on the location of land and its market value. In practice, this data would be difficult or impossible to collect; as a proxy, we therefore include an indicator for publicly-owned land.

Indicator	Data source	Level of detail (city/national)	Notes
Titling: Tenure insecurity	World Bank Property Rights Index	National	Data is disaggregated for urban and rural areas
Housing: Location of new housing	Satellite data	City	Data to be compiled by researchers
Housing: Cost of housing as percent of income	Survey	City	Data to be compiled by researchers
Employment: Location of new employment centers	Satellite data	City	Data to be compiled by researchers
Developable land: Publicly-owned land	Consultation with government agencies	City	Data to be compiled by researchers
Vulnerability: Total built-up area and total residents exposed to flood, storm surges, earthquakes, and heatwaves	European Commission Urban Center Database R2019	City	

4.2.2 Intracity accessibility: Transportation

Intracity transportation refers to roads and local transportation services. Both the availability and efficacy of transport infrastructure and connectivity must be measured in order to accurately determine whether it is a constraint to growth; in many African cities, for example, transportation services are available but slow and with limited range.

The ideal indicator of intracity transportation would indicate the quality of transportation networks and unevenness in the distribution of transportation throughout a city. However, the data collection process for this indicator would be highly time- and resource-intensive. The below indicators approximate this information by showing the distribution of road networks and the level of access to public transportation; they do not include information about the congestion of road networks or about alternative transportation methods, including walking and driving.

Indicator	Data source	Level of detail (city/national)	Notes
Distribution of paved roads, paved roads as a share of urban land	Lall, Henderson, and Venables (2017)	City	Limited data availability; methodology to be applied to pilot cities
Population within 10 minutes of transit hub	ITDP, European Commission	City	European Commission methodology can be applied in cases of limited data availability “Transit hub” refers to stations and stops of both formal (i.e., bus, subway) and informal (i.e., motorcycle taxi, minibus) transportation
Average speed on major routes during peak commuting hours (congestion)	Based on work by Peralta Quiros, Avner, and Kerzhner (2019)	City	Data source includes methodology to calculate travel times between origin and destination pairs; a variant on this methodology will be applied to calculate congestion

4.2.3 Intercity and international accessibility

Intercity and international accessibility refers to the existence and quality of transportation infrastructure such as roads, ports, and airports and transport services. These indicators seek to measure the ability of a city’s firms to access key inputs for production, either through importing or from within the country, and to export products. As above, both the availability and efficacy of transport infrastructure and connectivity must be measured in order to accurately determine whether it is a constraint to growth. The ideal indicator of intercity and international accessibility would be measured through a survey of firms that collects data on their ability to access inputs from outside of the city and their ease of exporting.

Indicator	Data source	Level of detail (city/national)	Notes
Quality of roads	World Economic Forum Global Competitiveness Index	National	
Existence of port/airport	Google/Google Maps	City	Data to be compiled by researchers
Quality of port infrastructure	World Economic Forum Global Competitiveness Index	National	
Quality of transport logistics and infrastructure	World Bank Logistics Performance Index	National	

4.3 Business environment

The local business environment encompasses a range of factors that affect the competitiveness of cities in attracting firms including labor and human capital, the regulatory environment, and services and infrastructure. Some of the factors identified may require action at both local and national levels, but can nonetheless act as serious impediments for local business activity.

Within cities, the relative importance of various business environment factors changes based on firm size and performance. Firms that are growing or shrinking also tend to face more constraints than stable firms. Growing firms tend to identify skills and transportation as constraints, while contracting ones identify labor regulations and informality. Similarly, smaller firms find access to finance and corruption to be more important, whereas larger firms name labor skills and time spent dealing with officials (Hallward-Driemeier and Aterido 2009). It is thus important to know both the frequency with which a factor is reported to be a constraint and the composition of firms identifying a factor as a constraint in order to ensure that the needs of productive or potentially productive firms are prioritized.

4.3.1 Labor and human capital

Measuring wage premiums for workers across education levels can lead to the identification of labor supply constraints: If highly educated workers are undersupplied in a city, they are likely to command a higher wage premium than in cities with no labor supply concerns. Using surveys, we can identify whether firms in a city are constrained by an inadequately trained workforce. Looking at the average education level in a city and the returns to secondary and tertiary education can allow for identification of cities constrained by poorly educated or unspecialized workforces and can allow for comparisons across cities.

Indicator	Data source	Level of detail (city/national)	Notes
Firms identifying an inadequately educated workforce as a major constraint	World Bank Enterprise Surveys	City	
Returns to education (secondary, tertiary)	Labor force surveys	City	
Average level of education	Labor force surveys	City	

4.3.2 Regulatory environment

The regulatory environment specifically refers to those regulations that affect firms and their ability to do business. It includes measures on the ease of entry and exit, tax regulations, and labor regulations, among others.

Indicator	Data source	Level of detail (city/national)	Notes
Percent of firms identifying labor regulations as a major impediment	World Bank Enterprise Surveys	City	
Time to start a business, number of procedures to start a business, ease of paying taxes	World Bank Doing Business	City	All Doing Business data is collected in the primary city of countries

4.3.3 Services and infrastructure

Services and infrastructure affect both the ability of firms to function and be productive. Indicators such as access to electricity and the internet can help identify constraints to firms' ability to capitalize on agglomeration economies.

Indicator	Data source	Level of detail (city/national)	Notes
Electricity access	U.N. Habitat Global Urban Observatory	City	
Internet and telephone services	U.N. Habitat Global Urban Observatory	City	
Power outages, value lost due to power outages, reliability of connection	World Development Indicators, World Bank Enterprise Surveys/Doing Business	City/National	All Doing Business data is collected in the primary city of countries

4.4 Public sector governance

The governance assessment will first determine the formal division of responsibilities between levels of government (national, regional, or local) for the various elements comprising accessibility and the business environment. This will help guide the next level of assessment on the efficacy of the various responsible agencies and the quality of policies within each sector, whether that be land, transport, or business regulation.

To measure the capacity of government, we propose a survey of key stakeholders in government, civil society, and the private sector covering a variety of key issues. This survey would focus on how policies are actually carried out: For instance, if there are land rights, how transparently are they applied? If there are land use regulations and zoning laws, are these contributing to misaligned land uses or directed at protecting public interests? Are rules for appropriating private property for investments, such as road rights-of-way, fair and transparent?

We then assess aspects of fiscal governance through measures that indicate whether or not the municipality is tapping own-source revenue, such as with property taxes, and through measures that identify the process by which national revenues are allocated to local expenditures. These latter measures address whether revenues are distributed on a legislatively-fixed formula basis, ensuring consistency from year to year, or whether revenues are allocated on a more subjective, political basis. The latter would indicate a potential fiscal constraint for longer-term capital investments.

Indicator	Data source	Level of detail (city/national)	Notes
Functional responsibility: Responsibilities covered by budget	U.N. Habitat Global Municipal Database	City	Additional data may need to be collected
Functional performance: Efficacy of government institutions	Survey	City	Data to be compiled by researchers
Fiscal responsibility: Percent own source revenue	U.N. Habitat Global Municipal Database	City	Additional data may need to be collected
Fiscal responsibility: Predictability of transfers from higher level of government	Public Expenditure and Financial Accountability (PEFA) program	City	Additional data may need to be collected

5. Applying the proposed framework

Our analytical framework in Section 3 and the discussion of the related indicators and data sources in Section 4 present the key inputs for identifying and analyzing constraints to city-level growth. In this

section, we propose and outline an approach—and the key requirements and assumptions—needed to conduct the constraints analysis. We offer a five-step process for the application of the city-level constraints analysis.

This approach is intended to serve as the basis for case studies. The proposed framework and indicators should guide the work, but there can be no formulaic methodology for identifying the city-level constraints. In all cases, context matters, and the judgement of the analyst applying the methodology should be a significant element of the process.

Step 1: Placing the city in the context of national growth

Rather than incorporate the city-level growth diagnostic into the larger country growth diagnostic, our view is that it is more efficient to carry out each diagnostic exercise independently. Thus, prior to conducting the city-level diagnostic, a national growth diagnostic should be completed. This step is useful in two respects. First, the national-level diagnostic should make clear those elements of the national economic environment that also inhibit growth and agglomeration at the city level. Second, the national-level diagnostic will help guide appropriate policy responses for relieving constraints at the city level. For example, lack of access to finance may inhibit the growth of firms at the city level. It is likely, however, that the policy solutions to increasing access to finance will be found at the national level.

In order to place the city within the context of national growth, we need data on its economic performance. These data may not be readily available at the city level but can be constructed from local sources, including surveys of manufacturing or production that incorporate geographical location. A city is likely to be underperforming in terms of its contribution to national economic growth if production in the city is heavily concentrated in non-tradables.

Once the level of performance of the city has been established, the city-level diagnostic is intended to focus on the root causes of the city's lack of contribution to growth by identifying the constraints to agglomeration that are specific to the city.

Step 2: Compiling key measures of agglomeration for the city under study

The next phase of the diagnostic is to compile the measures outlined in Section 4 that indicate the level of accessibility and the quality of the business environment for the city under study. The potential pre-existing sources for many of the indicators are presented in Section 4, but there are a number of indicators that will require collection in the city under study. For example, most of the indicators relating to the business environment are available through World Bank or U.N. Habitat sources. Only the measures of returns to education and average level of education require city-specific surveys. Similarly, the intracity and intercity transport-related measures are normally available from existing national transport studies conducted for major cities.

The more challenging measure is intracity accessibility, which requires city-specific data collection and analysis. As discussed earlier, accessibility measures represent a growing effort worldwide, and no definitive measurement standards exist. One major measurement challenge is related to determining the location of employment opportunities. In most developing countries, it is difficult to obtain meaningful statistics for employment by neighborhood, to distinguish between formal and informal jobs, and to determine the nature and appropriateness of jobs for a given population. These difficulties have led researchers to apply a variety of methods and proxy measurements (see Peralta Quiros, Avner, and Kerzhner 2019), which, while approximations, have proven useful for providing a broad understanding of accessibility levels.

Moreover, while urban transport measures are relatively standardized, measures of land use as it relates to access are evolving and require city-specific collection and analysis. We have suggested measures that indicate trends in land use, including the change in location of housing and employment centers over time relative to existing infrastructure, as well as indicators of the potential symptoms and underlying causes of inefficient land uses such as relative housing prices, land rights, and vulnerability.

For all of the indicators, it is clear that no single measure is sufficient to identify a constraint. How these measures, then, are applied in practice becomes key.

Step 3: Identifying major constraints

After having collected data for all indicators, we can begin to assess the relative seriousness of the constraints. The goal of this step in the process is to answer: Which of the constraints are critical to unlocking the potential benefits of agglomeration? In our view, there is no formulaic way to judge which constraints are binding. However, it should be possible to identify indicators in which the city under study performs particularly poorly. For some indicators, an assessment of performance may be achieved through a comparison analysis with other relevant cities. For others for which comparable data is not available, only a focus on the specific city will be feasible.

As presented in Step 2, data for many of the indicators—such as many measures of the business environment—exist for comparable cities across Africa as well as in other parts of the world. In this case, in order to ensure comparability, it is important to classify cities to determine relevance to the subject city. Classification will be determined by the structure of the economy (whether it is heavily dependent on natural resources), the income level (whether it is high or upper-middle income or lower-middle to low income), and the city population.

In the case of measures that do not have credible comparison data elsewhere, a more detailed, specific analysis at the city level is necessary. For example, even though intracity accessibility in Africa has been the subject of comparison studies, the use of different proxy measures for employment opportunities indicates the need for a more specific city-level study, where feasible, to gain more direct information. Similarly, for land use, there are comparators for housing prices as a percentage of income across a range of cities, but not for the other indicators such as location of new housing and employment. Again, this requires a city specific assessment.

The challenge, then, is to define an appropriate threshold when comparators are limited or non-existent. For example, if under 20 percent of new housing and employment is situated outside of the range of the existing transport network, it is unlikely that the city has a land use issue. But, if over 40 percent of new housing and employment is located in areas disconnected from the infrastructure system, there is clearly a land use problem. Defining these types of thresholds, however, requires analysis and understanding of the city under study.

Ultimately, no single indicator is sufficient for identifying a critical constraint; it is the relationship among indicators that presents the clearest picture. For example, if you have high congestion or slow travel speeds, and most new housing and employment is located along the transport network, there is clearly a transport problem. If you have high housing prices, new housing is disconnected from the transport network, and road space as a percentage of developed land is low outside of the central city area, then the situation is more complex, and likely is a result of a combination of land use and intracity transport issues. Disentangling the relative importance of these factors requires informed judgement and an understanding of the city context.

As this analysis is undertaken, several common issues are likely to emerge. These include issues such as political stability, security, environmental problems, and other characteristics that may critically affect city-level productivity. These traits are not explicitly analyzed in the framework presented in Section 3, but may emerge as relevant to understanding the major constraints.

Step 4: Assessing public sector governance constraints

Once the constraints in Step 3 have been identified, it should be possible to identify viable policy, investment, or institutional reforms to address them. This is where governance enters the picture. Which level of government—national, state, city, or other public entity—has the functional and fiscal responsibility to address the issue? What is the efficacy of that agency’s ability to fulfill that function?

Rather than conducting a comprehensive assessment of the efficacy of all agencies—as this would not be feasible—we propose that only the particular agencies responsible for the problematic functions are identified and assessed. For example, if there is an issue with transport, what level of government is responsible? How well does that entity carry out its management of the sector? If there is an issue with land use, what level of government is responsible? Does it manage land use, such as land titling and planning, effectively? There is no shortcut method or indicator to determine efficacy; this requires engagement of key stakeholders, including from government, civil society, and the private sector, through surveys or other forms of consultation.

We have included only two indicators related to fiscal responsibility. The percentage of own-source revenue represents the opportunity—or lack of it—to raise resources at the local level. We recognize, however, that the fiscal capacity of most African cities is very limited, and they are unable to finance their infrastructure needs, for example, through own-source revenue or borrowing. Therefore, to indicate the viability of relying on national resources, a second measure looks at the process of distributing national resources. If this process varies significantly from year-to-year—resulting in unpredictable budgeting—and the capacity to raise own-source revenue is limited, fiscal capacity may represent a second-order constraint that affects the ability of a city to address its first-order constraints.

In addition, there may be an issue of coordination across agencies. Coordination may be particularly important where constraints are related to misalignment of employment centers, housing, and transport infrastructure: This issue is often seen in, for example, the disconnect between the location of SEZs and the planning of transport networks in Africa. The public sector governance assessment should thus also include an analysis of coordination across relevant agencies at various levels.

Step 5: Selecting the highest return interventions

The final step in the process is to link the constraints analysis of accessibility and the business environment (Step 3) with the public sector governance constraints (Step 4) and analyze the implications for any potential interventions. This analysis will lay the groundwork for a detailed cost/benefit analysis of specific interventions (to be proposed in the future) and for simulating the impact of those interventions on the constraints.

What may seem to represent a high-return intervention may prove infeasible given public sector governance constraints. For example, infrastructure investment solutions in a climate of low fiscal capacity may prove less credible than service regulatory reforms for informal transport. Land use changes for housing in a city with limited capability to access land may prove too impractical or long-term compared to extensions of transport links. Education interventions may not be viable until the responsible national agency delegates to the local level.

The objective is to lay out the advantages and disadvantages of different types of interventions based on the constraints analysis, which will help guide subsequent efforts to design appropriate policies and investments.

6. Conclusion

Urbanization is a key feature of structural change in low-income countries. Workers move from rural to urban areas in search of more productive and better-paid jobs, and entrepreneurs locate their firms in cities where agglomeration economies increase their productivity. The productivity gains created by scale, density, and economic interaction can be substantial. But our understanding of city growth and its relationship to national economic growth and structural change is limited. The recent experiences of East Asia and Africa feature very different patterns of urban development. East Asian cities have largely succeeded in generating higher productivity, more jobs, and the housing and services that make cities livable, while African cities have left a large majority of their populations without productive jobs or adequate housing and other services.

This paper attempts to increase our understanding of how major cities contribute to and benefit from national economic growth in low-income economies—mainly in Africa. We have argued that urbanization in Africa represents the world’s most pressing urban problem. African cities have grown more as a result of population growth and migration due to rural stagnation, rather than pulled by the dynamism of the urban economy. Urban costs are higher than for countries at similar levels of development, making cities less globally competitive. Furthermore, African cities are fragmented and disconnected, limiting their ability to benefit from agglomeration economies. Low levels of accessibility and high costs, in turn, limit cities’ ability to create productive jobs, particularly those that produce traded goods and services.

Some distinctive characteristics of African cities limit their ability to benefit from agglomeration. Investments in infrastructure, industrial and commercial structures, and affordable, formal housing have not kept pace with the growing concentration of people, leading to fragmentation. This fragmentation increases infrastructure costs and lengthens travel times, making it difficult for workers to access jobs. It also reflects failures of land use and management—the rules governing ownership of land and zoning. African cities are also costly relative to their country’s level of development. High urban costs have an impact on wages and international competitiveness, with the result that most African cities do not intensively produce tradable goods and services. This specialization in non-tradables limits their ability to contribute to economic diversity and sophistication, two key drivers of national economic growth.

As cities continue to grow in Africa—and across the world—it is important to identify and address the constraints to their productivity growth and their ability to contribute to structural change. This paper, therefore, presents a concise framework for understanding the constraints that cities face in generating productive jobs. The constraints analysis is based on three key elements—accessibility, the business environment, and public sector governance. Our approach attempts to bring together traditionally “siloed” perspectives drawn from urban planning and urban economics. We also take a cross-sectoral approach: One key example is the treatment of “accessibility” as a combination of land use and transport policies. This more robust approach opens the door to a broader range of strategic solutions.

The focus of our framework is explicitly on the city as the unit of analysis. We recognize that cities need to be seen in the context of the larger national economy and the constraints to its growth. Thus, the proposed analytical framework is designed as a complement to a broader national constraints assessment and focuses on issues that are particular to a given city.

We have also developed a set of indicators that allow us to analyze the performance of individual cities with respect to the main categories and sub-categories of the city constraints analysis. Many of these indicators are drawn from publicly accessible data available for a range of cities worldwide, though some indicators—particularly for accessibility—will require city-specific analysis. The indicators constitute a first step toward identifying potential constraints. To determine the severity of the constraint, however, it is useful to know how similar cities perform with respect to the same indicator. In order to provide a range of plausible outcomes for the indicators for similar cities, we develop an approach to identifying city comparators, as well as a process for analyzing indicators for which no comparators exist.

Any further application of the framework will require a more detailed understanding of the political, economic, and social context of the cities that are the subject of interest. It will also require data collection for a number of indicators for which no internationally comparable data or accepted methodological norms exist. For these reasons, the next step in attempting to validate the approach should be to focus on applying the methodology in one or more cities in Africa.

References

- Abel, J. R., Dey, I. and Gabe, T. M. (2011). Productivity and the density of human capital. *FRB of New York Staff Report 440*.
- Alm, J. (2015). Financing urban infrastructure: knowns, unknowns, and a way forward. *Journal of Economic Surveys*, 29(2), 230-262.
- Angel, S. (2017). Urban Forms and Future Cities: A Commentary. *Urban Planning* 2(1), 1-5.
- Avner, P. and Lall, S. (2016). *Matchmaking in Nairobi: The Role of Land Use*. Washington, D.C.: World Bank.
- Bahl, R. (2013). The Decentralization of Governance in Metropolitan Areas. In Bahl, R., Linn, J. F., and Wetzel, D. L. (Eds.), *Financing Metropolitan Governments in Developing Countries* (85-105). Cambridge, MA: Lincoln Institute of Land Policy.
- Behar, A. and Venables, A. J. (2011). Transport Costs and International Trade. In de Palma, A., Lindsey, R., Quinet, E., and Vickerman, R. (Eds.), *Handbook of Transport Economics* (97-115). Cheltenham, UK and Northampton, MA: Edward Elgar.
- Benjamin, N. C., and Mbaye, A. (2010). Informality, Productivity, and Enforcement in West Africa: A Firm Level Analysis. *International Policy Center Working Paper 100*.
- Bertaud, A. (2003). Clearing the Air in Atlanta: Transit and Smart Growth or Conventional Economics? *Journal of Urban Economics*, 54(3), 379-400.
- Bertaud, A. (2018). *Order Without Design: How Markets Shape Cities*. Cambridge, MA: MIT Press.
- Boadway, R. W., Roberts, S. and Shah, A. (1994). Fiscal Federalism: Dimensions of Tax Reform in Developing Countries. *World Bank Policy Research Working Paper 1385*.
- Byamugisha, F. F. (2013). *Securing Africa's Land for Shared Prosperity: A Program to Scale Up Reforms and Investments*. Washington, D.C.: World Bank.
- Cadot, O., Carrere, C., and Strauss-Kahn, V. (2008). Export Diversification: What's Behind the Hump? *CEPR Discussion Paper 6590*.
- Cartwright, A., Palmer, I., Taylor, A., Pieterse, E., Parnell, S. and Colenbrander, S. (2018). *Developing Prosperous and Inclusive Cities in Africa-National Urban Policies to the Rescue*. London and Washington D.C.: Coalition for Urban Transitions.
- Cervero, R. (2001). Efficient Urbanization: Economic Performance and the Shape of the Metropolis. *Urban Studies* 38(10), 1651-71.
- Chen, M. A. and Beard, V. A. (2018). *Including the Excluded: Supporting Informal Workers for More Equal and Productive Cities in the Global South*. Washington, D.C.: World Resources Institute.
- Collier, P. (2017). African Urbanization: An Analytic Policy Guide. *Oxford Review of Economic Policy* 33(3), 405-37.

Collier, P. and Venables, A. J. (2016). Urban Infrastructure for Development. *Oxford Review of Economic Policy* 32(3), 391-409.

Collier, P. and Venables, A. J. (2017). Urbanization in Developing Economies: The Assessment. *Oxford Review of Economic Policy* 33(3), 355-72.

Daly, J. and Gereffi, G. (2019). Tourism Global Value Chains and Africa. In Newfarmer, R., Page, J. and Tarp, F. (Eds.), *Industries without Smokestacks: Industrialization in Africa Reconsidered* (68-89). Oxford: Oxford University Press.

Dinh, H. T., Mavridis, D. A. and Nguyen, H. B. (2012). The Binding Constraint on the Growth of Firms in Developing Countries. In Clarke, G. R. G. and Dinh, H. T. (Eds.), *Performance of Manufacturing Firms in Africa: An Empirical Analysis* (87-137). Washington, D.C.: World Bank.

Djankov, S., La Porta, R., Lopez-de-Silanes, F. and Shleifer, A. (2002). The Regulation of Entry. *The Quarterly Journal of Economics* 117(1), 1-37.

Farole, T. (2011). *Special Economic Zones in Africa: Comparing Performance and Learning from Global Experiences*. Washington, D.C.: World Bank.

Filmer, D. and Fox, L. (2014). *Youth Employment in Sub-Saharan Africa*. Washington, D.C.: World Bank.

Frischtak, C. R. (2018). Telecommunication and ICT-Based Services Trade. In Newfarmer, R., Page, J. and Tarp, F. (Eds.), *Industries without Smokestacks: Industrialization in Africa Reconsidered* (48-67). Oxford: Oxford University Press.

Gelb, A., Meyer, C. and Ramachandran, V. (2013). Does Poor Mean Cheap? A Comparative Look at Africa's Industrial Labor Costs. *Center for Global Development Working Paper* 325.

Gelb, A., Ramachandran, V., Shah, M.K. and Turner, G. (2008). *What Matters to African Firms? The Relevance of Perceptions Data*. Washington, D.C.: World Bank.

Glaeser, E. L. and Kohlhase, J. E. (2004). Cities, Regions, and the Decline of Transport Costs. In Florax, R. and Plane, D. A. (Eds.), *Fifty Years of Regional Science* (197-228). Berlin Heidelberg: Springer-Verlag.

Glaeser, E. L. and Xiong, W. (2017). Urban Productivity in the Developing World. *Oxford Review of Economic Policy* 33(3), 373-404.

Gollin, D., Jedwab, R. and Vollrath, D. (2016). Urbanization with and Without Industrialization. *Journal of Economic Growth* 21(1), 35-70.

Gutman, J., Tomer, A., Kane, J., Patel, N., and Shivaram, R. (2017). *Delivering Inclusive Access: A Framework to Guide Researchers, Policymakers, and Practitioners Working in Urban Transport*. Washington, D.C.: Brookings Institution.

Hallward-Driemeier, M. and Aterido, R. (2009). *Comparing Apples with... Apples: How to Make (More) Sense of Subjective Rankings of Constraints to Business*. Washington, D.C.: World Bank.

- Hausmann, R., Hwang, J. and Rodrik, D. (2007). What You Export Matters. *Journal of Economic Growth* 12(1), 1-25.
- Hausmann, R., Rodrik, D. and Velasco, A. (2005). Growth Diagnostics. *Working paper*.
- Henderson, V. and Nigmatulina, D. (2016). The Fabric of African Cities: How to Think about Density and Land Use. *Unpublished paper*.
- Hjort, J. and Poulsen, J. (2019). The Arrival of Fast Internet and Employment in Africa. *American Economic Review* 109(3), 1032-79.
- Hommann, K. and Lall, S. V. (2019). *Which Way to Livable and Productive Cities? A Road Map for Sub-Saharan Africa*. Washington, D.C.: World Bank.
- Iacovone, L. and Ramachandran, V. (2014). Why Don't African Firms Create More Jobs? *Center for Global Development Working Paper* 353, 8-23.
- Imbs, J. and Wacziarg, R. (2003). Stages of Diversification. *American Economic Review* 93(1), 63-86.
- Klapper, L., Laeven, L. and Rajan, R. (2004). Barriers to Entrepreneurship. *NBER Working Paper* 10380.
- Lall, S. V., Henderson, J. V., and Venables, A. J. (2017). *Africa's Cities: Opening Doors to the World*. Washington, D.C.: World Bank.
- Lewis, W. A. (1979). The Dual Economy Revisited. *The Manchester School* 47(3), 211-99.
- Martinez-Vazquez, J. and McNab, R. M. (2003). Fiscal Decentralization and Economic Growth. *World Development* 31(9), 1597-616.
- McCulloch, N. and Zileviciute, D. (2017). Is Electricity Supply a Binding Constraint to Economic Growth in Developing Countries? *Energy and Economic Growth State-of-Knowledge Paper Series* 1(3).
- McMillan, M., Page, J., and Wangwe, S. (2016). Unlocking Tanzania's Manufacturing Potential. In Adam, C., Collier, P., and Ndulu, B. (Eds.), *Tanzania: Path to Prosperity*. Oxford: Oxford University Press.
- McMillan, M., Rodrik, D., and Verduzco-Gallo, I. (2014). Globalization, Structural Change, and Productivity Growth, with an Update on Africa. *World Development* 63(1), 11-32.
- Melo, P. C., Graham, D. J. and Brage-Ardao, R. (2013). The Productivity of Transport Infrastructure Investment: A Meta-analysis of Empirical Evidence. *Regional Science and Urban Economics* 43(5), 695-706.
- Mensah, J.T. (2018). *Jobs! Electricity Shortages and Unemployment in Africa*. Washington, D.C.: World Bank.
- Nakamura, S., Harati, R., Lall, S.V., Dikhanov, Y.M., Hamadeh, N., Oliver, W.V., Rissanen, M.O. and Yamanaka, M. (2016). *Is Living in African Cities Expensive?* Washington, D.C.: World Bank.

- Newfarmer, R., Page, J. and Tarp, F. (Eds.) (2018). *Industries without Smokestacks: Industrialization in Africa Reconsidered*. Oxford: Oxford University Press.
- Newman, C., Page, J., Rand, J., Shimeles, A., Söderbom, M. and Tarp, F. (Eds.) (2016). *Manufacturing Transformation: Comparative Studies of Industrial Development in Africa and Emerging Asia*. Oxford: Oxford University Press.
- Newman, C. and Page, J. (2017). Industrial Clusters: The Case for Special Economic Zones in Africa. *WIDER Working Paper 2017/15*.
- Ngui, D. and Kimuyu, P. (2018). Prospects for Information and Communications Technology-enabled Services in Kenya: The Case of the Mobile Money Transfer Industry. In Newfarmer, R., Page, J. and Tarp, F. (Eds.), *Industries without Smokestacks: Industrialization in Africa Reconsidered* (213-31). Oxford: Oxford University Press.
- Oates, W.E. (1972). *Fiscal Federalism*. New York: Harcourt Brace Jovanovich.
- Page, J. (2012). Can Africa Industrialize? *Journal of African Economies* 21(2): ii86-ii125.
- Page, J. (2019). *Industries Without Smokestacks—Firm Characteristics and Constraints to Growth*. Washington, D.C.: Brookings Institution.
- Paunov, C. and Rollo, V. (2015). Overcoming Obstacles: The Internet's Contribution to Firm Development. *The World Bank Economic Review* 29(1), S192-S204.
- Peralta Quiros, T., Kerzhner, T., and Avner, P. (2019). Exploring Accessibility to Employment Opportunities in African Cities: A First Benchmark. *World Bank Policy Research Working Paper 8971*.
- Peralta Quiros, T. and Mehndiratta, S. R. (2015). Accessibility Analysis of Growth Patterns in Buenos Aires, Argentina: Density, Employment, and Spatial Form. *Transportation Research Record: Journal of the Transportation Research Board* 2512(1), 101-9.
- Pieterse, E. (2010). Filling the Void: Towards an Agenda for Action on African Urbanization. *Urbanization Imperatives for Africa: Transcending Policy Inertia* (7-45). Cape Town, South Africa: African Center for Cities.
- Quigley, J.M. (2009). Urbanization, Agglomeration, and Economic Development. *Commission on Growth and Development Working Paper 19*.
- Rodrik, D. (2013). Structural Change, Fundamentals, and Growth: An Overview. *Working Paper*.
- Seker, M. (2010). Difficulties in Job Creation and Exporting. *World Bank Enterprise Note Series 12*.
- Smoke, P. (2013). Metropolitan Cities in the National, Fiscal, and Institutional Structure. In Bahl, R., Linn, J. F., and Wetzel, D. L. (Eds.), *Financing Metropolitan Governments in Developing Countries* (57-84). Cambridge, MA: Lincoln Institute of Land Policy.
- Soulage, B., Conroy, C., Sow, M. (2017). *Fiscal Decentralization and 21st Century Cities in France*. Washington, D.C.: Brookings Institution.
- Stiglitz, J. E. (2018). From Manufacturing-led Export Growth to a Twenty-first-century Inclusive Growth Strategy. *WIDER Working Paper 2018/176*.

Subramanian, U. and Matthijs, M. (2007). *Can Sub-Saharan Africa Leap into Global Network Trade?* Washington, D.C.: World Bank.

Sutton, J. (2012). *Competing in Capabilities: The Globalization Process*. Oxford, UK: Oxford University Press.

UCLG. (2015). *Decentralization Processes at a Crossroads: State of Affairs and Perspectives*. Barcelona: United Cities and Local Governments.

UNIDO. (2009). *Industrial Development Report, 2009: Breaking in and Moving Up—Industrialization Challenges for the Bottom Billion and Middle Income Countries*. Vienna: United Nations Industrial Development Organization.

United Nations. (2015). Indicator 7.10 Proportion of Urban Population Living in Slums. *Millennium Development Goals Indicators*. Retrieved from <http://mdgs.un.org/unsd/mdg/seriesdetail.aspx?srid=710>.

United Nations Conference on Housing and Sustainable Urban Development. (2017). *Habitat III Policy Papers: Policy Paper 5, Municipal Finance and Local Fiscal Systems*. New York: United Nations.

United Nations Department of Economic and Social Affairs. (2018). *World Urbanization Prospects: The 2018 Revision*. New York: United Nations.

Venables, A. J. (2017). *Breaking into Tradables: Urban Form and Urban Function in a Developing City*. Washington, D.C.: World Bank.

Venables, A. J. (2018). Urbanization in Developing Economies: Building Cities that Work. *REGION 5*(1), 91-100.

Venter, C. (2016). *Developing a Common Narrative on Urban Accessibility: A Transportation Perspective*. Washington, D.C.: Brookings Institution.

World Bank. (2007). *Expanding the Possible in Sub-Saharan Africa: How Tertiary Institutions Can Increase Growth and Competitiveness in Sub-Saharan Africa*. Washington, D.C.: World Bank.

World Bank. (2013). *Turn Down the Heat: Climate Extremes, Regional Impacts, and the Case for Resilience*. Washington, D.C.: Potsdam Institute for Climate Impact Research and Climate Analytics, for the World Bank.

World Bank. (2015). *Investing in Urban Resilience: Protecting and Promoting Development in a Changing World*. Washington, D.C.: World Bank.

WTO. (2007). *World Trade Report: Trade in a Globalizing World*. Geneva: World Trade Organization.

Zegras, C. and Gakenheimer, R. (2006). Driving Forces in Developing Cities' Transportation Systems: Insights from Selected Cases. *Working paper*.