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Synopsis: Ethiopia's Spatial and Structural Transformation: Public Policy and Drivers of change

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RESEARCH OVERVIEW

Ethiopia is urbanizing rapidly, but from a low base. The urban population grew at a rate of 4.2 percent per year between 1994 and 2015, far outpacing the overall population growth rate of 2.5 percent. Compared to the 3.5 percent annual urban population growth rate of Africa, Ethiopia's urban population is growing 20 percent faster. It is expected to reach 38 percent of the total population by 2040. However, this level is still low relative to the majority of African countries.

This research note evaluates Ethiopia's demographic shift over the last four decades while also evaluating potential urbanization trends 20 years into the future.[1] Propelling Ethiopia's urban growth is new secondary city development, ongoing population growth in small towns, and improved access to markets. In order to understand how secondary city growth is contributing to urbanization, we update the agglomeration index for the country. In addition, we look at recent patterns of domestic migration. Reviewing the government's investment strategy in industrial parks and sugar factories, we explore current plans for industrial zones in Ethiopia. In examining the scope for their success, we consider the key role that government policy will need to play in terms of overall investment in infrastructure, as well as the major implications of macro-economic and trade policies to motivate increased private sector investment in Ethiopia's industrial sector.

INTRODUCTION

Rapid and expanding urbanization and improved market access will drive Ethiopian economic growth into the future. Over the last three decades, the size and number of cities dramatically increased across Ethiopia. In 1994, Ethiopia had a population of over 53.6 million people, with 13 cities with a population greater than 50,000 people (for this analysis cities are classified as having at least 50,000 people). By 2007, the total population had increased by 20 million and the number of cities doubled to 26. By 2015, the total population increased another 18 million from 2007, and the number of cities almost doubled again to 45 cities.

Whereas previously Addis Ababa, the nation's capital city, was the primary focus of urban economic activity, the geographically dispersed urban areas that have developed over the last several decades are poised to drive future urban population growth throughout the country. Looking forward, the annual percentage population growth rate of medium (50,000 to 100,000 people) and large cities (100,000 to 500,000 people) will outpace Addis Ababa's population growth (Figure 1).

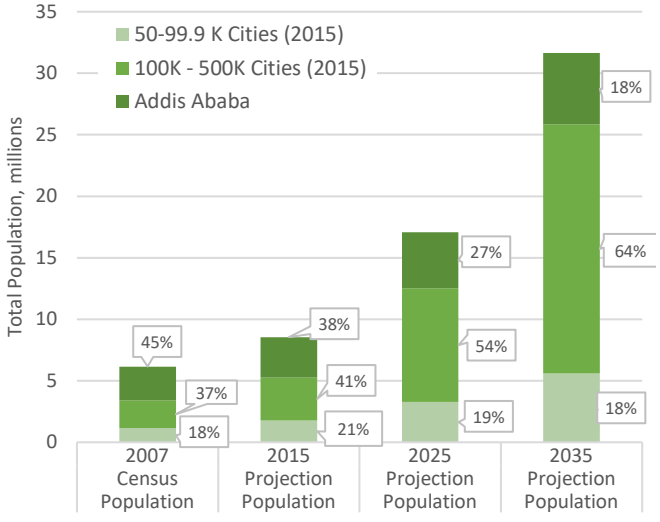
Populations have been increasing rapidly across all city sizes, averaging 4.37 percent overall between 2007 and 2015. However, notably the population of Addis Ababa grew more slowly at a rate of 2.25 percent per year over this period, while the population growth rates of cities with between 100,000 and 500,000 people grew at twice that rate.

As the number of urban centers continue to increase and accompanying improvements in transportation infrastructure facilitate the movement of goods and people, it is expected that population agglomerations will continue to grow, extending past official urban boundaries. In addition, structural transformation of the economy, with a shift in employment from agricultural-focused to more high-value industry and service focused activities, will bolster rural to urban migration, fueling further urban population growth.

DATA AND METHODOLOGY

The Central Statistical Agency (CSA) of Ethiopia implements a variety of nationally representative surveys that provide information on the demographic and socio-economic condition of the country. The analyses in this note use the census data from 1984, 1994, and 2007 as well as the

Figure 1: Urban population of Ethiopia categorized by population size of city of residence



Source: Central Statistical Agency of Ethiopia (1984, 1994, 2007, 2015), EGIS (2016), and authors' calculations.

Note: City size categories are defined in terms of 2015 population (using CSA urban population projections) regardless of population sizes in years prior to or following 2015. This permits the examination of changes in population for a consistent set of geographic localities over time.

[1] A detailed discussion of this research can be found in ESSP Working Paper 119, *Ethiopia's Spatial and Structural Transformation: Public Policy and Drivers of Change*: http://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/132728/filename/132940.pdf.

population projection figures CSA publishes based on demographic trends within the country. For the growth rate of Ethiopia's urban population, however, instead of CSA's 3.8 percent per year rate estimated using the urban-rural growth differential method, an average urban growth rate of 5.4 percent per year up to 2037 is used, as reported in the World Bank's Ethiopian urbanization review (2015). This is estimated by combining natural population growth, rural-urban migration, migration to mega-project sites, and urban area expansion. In addition, we use this data to calculate labor force participation rates, to categorize cities by population size, and to determine the size of population age groups.

In order to calculate urbanization using the agglomeration methodology index, we use several population datasets. We then compare these datasets to the CSA population figures published in census reports and documents on population projections. Given that the agglomeration index methodology attempts to define the urban population based on market access and population density thresholds, a population dataset that is not restricted to administrative boundaries is necessary. To evaluate the extent of Ethiopia's urban population, we use two spatial datasets of population by 1km grid cell unit, namely LandScan and GRUMP. These datasets were processed to be comparable to the CSA population statistics published in the census reports. This was done in order to examine the distribution of the population during the study years, as well as to develop simulations of the future distribution of Ethiopia's urban population.

URBANIZATION AND THE AGGLOMERATION INDEX

We update an earlier agglomeration index analysis (Schmidt and Kedir 2010) to evaluate the extent of urbanization in Ethiopia in 2015 and population agglomeration trends over the last four decades. Using the agglomeration index, an area is considered urban if it is within one-hour travel time of a city of at least 50,000 people and has a population density of at least 150 people/km^2. While in 1984, only 4 percent of Ethiopia's population was considered urban based on the agglomeration index, almost 22.5 percent of the population was urban in 2015 (Table 1).

Table 1: Agglomeration Index 1984 to 2015, percentage share of region's population

Region	Urban share of population, percent			
	1984 [a]	1994	2007	2015
Addis Ababa	57.5	91.1	91.9	99.9
Afar	-	-	-	0.6
Amhara	3.2	4.9	7.9	14.0
Benishangul-Gumuz	-	-	-	-
Dire Dawa	16.9	55.8	59.5	67.9
Gambella	-	-	-	11.9
Harari	44.7	75.8	81.0	94.3
Oromia	2.0	5.2	10.3	15.9
SNNP	-	2.6	23.7	39.5
Somali	0.3	2.4	2.7	2.4
Tigray	2.7	4.3	8.1	19.1
Ethiopia	4.2	8.0	15.1	22.5

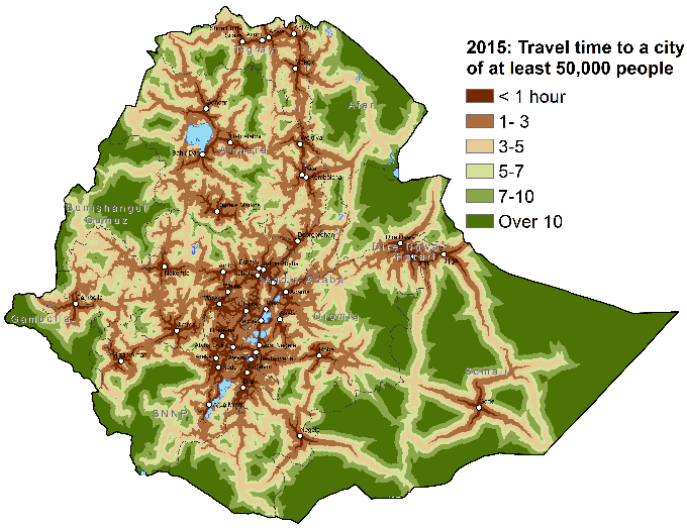
[a] Population figures for 1984 were approximated due to changes in administrative boundaries after 1984. To maintain consistency across all years, we geographically allocated population to the current regional boundaries.

Urbanization is taking place in a variety of ways across the Ethiopian landscape including within urban areas via population density growth, as well as via agglomeration effects along major transportation corridors. Investments and improvements in the major transportation arteries over the past 25 years as well as the accelerated development of regional secondary cities have also improved the accessibility of remote, rural areas to urban centers (Table 2; Figure 2). Between 2007 and 2015, an additional 15 percent of the population – from 44.4 percent in 2007 to 58.6 percent in 2015 – saw their travel time to the nearest city of at least 50,000 fall below 3 hours. Even the most remote population group located more than 10 hours travel time from the nearest city saw its size decrease from 11 percent of the population in 2007 to 5.4 percent in 2015.

Table 2: Travel time to a city with population of at least 50,000 people, percent of total population, 2015

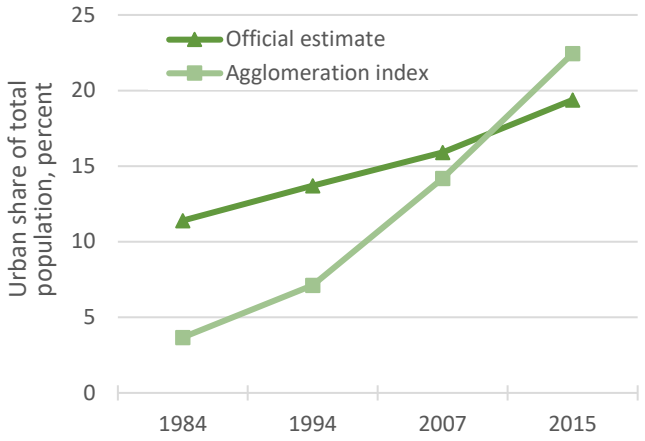
Region	< 1 hour	1 - 3 hours	3 - 5 hours	5 - 10 hours	> 10 hours
Tigray	24.7	34.9	20.0	18.1	2.4
Afar	1.2	18.3	26.3	41.7	12.6
Amhara	16.2	39.3	24.9	17.6	2.1
Oromia	18.2	39.7	24.5	15.4	2.2
Somali	4.3	11.0	12.8	29.7	42.0
Benishangul-Gumuz	0.1	1.3	18.3	48.9	31.4
SNNP	40.4	36.2	11.2	9.6	2.5
Gambella	15.7	18.0	16.3	27.6	22.4
Harar	94.3	5.7	-	-	-
Addis Ababa	99.9	0.1	-	-	-
Dire Dawa	69.0	16.8	8.8	5.5	-
Ethiopia	24.5	34.1	19.8	16.2	5.4

Figure 2: Travel time to a city of at least 50,000 people in 2015



Comparing Ethiopia's urban share of the total population as measured by the agglomeration index with official urbanization rates, which are based on administrative boundaries, suggests that urban population growth may be occurring faster than officially projected. Until 2007, Ethiopia's urban population share reported by the CSA was greater than the agglomeration index estimation. Fewer urban centers and a limited road network resulted in lengthy travel times to urban areas for most of the population. Hence, a lower agglomerated area estimate resulted. However, by 2015 the compounded effect of city and population growth, along with ongoing investments in road infrastructure improved accessibility and led to a higher urbanization growth rate based on the agglomeration index than that based on CSA official urban population computation method based on administrative boundaries (Figure 3).

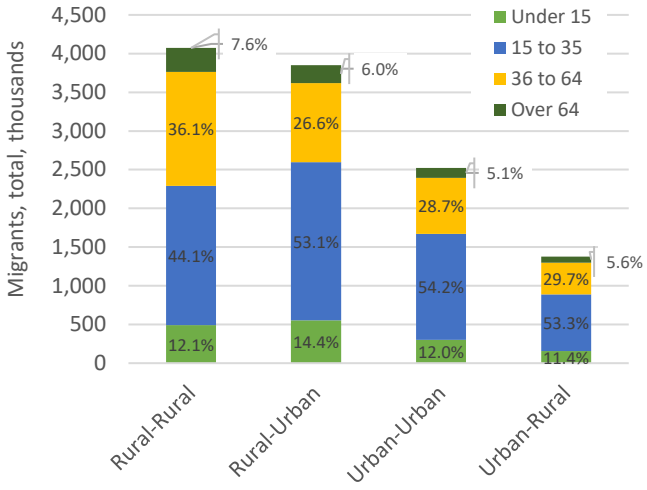
Figure 3: Urban share of population of Ethiopia, agglomeration index and CSA official estimates



MIGRATION AND STRUCTURAL TRANSFORMATION IN ETHIOPIA

According to the last three censuses in Ethiopia of 1984, 1994 and 2007, the share of the Ethiopian population that migrated from their original district continues to increase. Almost half of the migrants in 2007 migrated from a rural area to another rural area, while approximately a third moved from a rural to an urban area. More recent data collected by the National Labor Force Survey in 2013 (NLFS) suggests that rural-to-rural and rural-to-urban migration shares are almost equivalent at 35 and 33 percent of total migrants, respectively. Migration destinations vary by regions; for example, rural-to-rural migration is much more common than rural-to-urban migration in Amhara, Oromia and SNNP regions. Youth between the ages of 15 and 35 years make up the largest share of migrants (Figure 4).

Figure 4: Forms of migration by age group, percent of migrants by migration type



Source: Authors' calculations using NLFS 2013

More detailed studies of migration in Ethiopia suggest that migrants are predominantly 'pushed' from their homes rather than attracted by an urban 'pull' of higher returns on human capital investments. According to the NLFS data, only 32 percent of migrants 15 years or older move in search of jobs or due to job transfers. When migrants are disaggregated by places of origin and destination, less than half of total migrants who move from rural to urban areas are motivated to migrate in search of work. Rather, more than half of rural-to-urban migrants are either looking to improve their education, reunite with family members, are moving due to having been displaced, or have faced a shortage of agricultural land in their origin location.

Corroborating this evidence, several other analyses suggest that migrants in Ethiopia are 'pushed' from rural areas in order to diversify their income earning opportunities – as a welfare insurance mechanism. Asfaw et al. (2010) report that young men are the most frequent migrants in Amhara region and cite a lack of sufficient means of subsistence, shortage of land, and shortage of employment opportunities in the rural areas as their primary reasons for migrating. Dorosh et al. (2011) report that households with more agricultural land are less likely to send migrants, while poorer households and households afflicted by a community-wide drought are more likely to have migrant household members. Similarly, Kosec et al. (2017) find that larger land inheritances lead to lower rates of male youth rural-to-urban migration in Ethiopia and increase the likelihood of their employment in the agricultural sector. These findings are echoed by Gray and Mueller (2012), who additionally find that male labor migration in Ethiopia increases with higher incidence of drought in the place of origin.

FUELING ECONOMIC AND DEMOGRAPHIC AGGLOMERATION: ETHIOPIA'S INDUSTRIAL PARKS

Five industrial parks are currently operational in Ethiopia, all of which include apparel and textiles as the primary industry sub-sector operating in them. The first four parks have a current combined area of 427 hectares with approximately 41,000 people currently employed. These together are expected to expand in area to 2,147 hectares with 189,000 people employed in the next five to ten years. The current developed area of these four parks is about 20 percent of the target, while employment currently sits at about 22 percent of the targeted total employment.

Seven parks are currently under construction, and up to seven more parks are planned for construction and development in the next five years. Some estimates have projected that two million jobs will ultimately come from the almost 20 industrial parks in current plans. This amounts to between 3 and 5 percent of Ethiopia's total labor force.

Employment across all 11 industrial parks now in operation or under construction is expected to reach 352,000 employees at a total investment of 1.8 billion USD and a public investment share of 1.1 billion USD. This yields one job per 10,000 USD of total investment, about one job per 3,300 USD of public investment, and approximately 250 million USD in annual wages paid.

Ethiopia plans to develop and support industrial zones aimed at higher-value manufacturing and service activities. However, to do so a focus on increasing human capacity and labor mobility will be necessary to ensure that rural farmers are able to take advantage of these new labor opportunities outside of the agriculture sector. The following section models a variety of scenarios to understand how Ethiopia's focus on industrialization will impact future GDP and employment.

ESTIMATES OF MULTIPLIER EFFECTS ON GDP AND EMPLOYMENT

Summary data on investment and production for Ethiopia's industrial, agro-industrial parks, and sugar factories is presented in Table 3, along with calculations of the multiplier effects of these investments.

Table 3: Estimates of Multiplier Effect of Investments in Industrial Parks and Sugar Factories in Ethiopia

	Invest-ment (million USD)	Produc-tion (million USD)	Value-added [a] (million USD)	Total Value-added I [b] (million USD)	Value-added I ÷ Invest-ment	Total Value-added II [c] (million USD)	Value-added II ÷ Invest-ment
Industrial Parks (9)	1,739	6,569	1,693	2,963	1.70	3,556	2.04
Agro-Industrial Parks (4)	2,370	2,109	697	1,220	0.51	1,464	0.62
Sugar Factories (9)	5,173	3,597	3,327	5,823	1.13	6,988	1.35
Totals	9,282	12,275	5,717	10,006	1.08	12,008	1.29

Notes:
[a] Value-added is estimated using value-added as a share of production coefficients consistent with Ethiopia's national accounts.
[b] Total value-added I is based on a multiplier of 1.75, an average of national economy-wide multiplier estimates using endogenous price (computable general equilibrium) models.
[c] Total value-added II uses a multiplier of 2.10, based on national semi-input-output fixed price models. These larger multipliers may be appropriate for local economy effects where there is substantial underemployment.

With total investment in the industrial parks of 1.74 billion USD, estimated production and value-added are 6.57 and 1.69 billion USD, respectively. After including estimated multiplier effects, total value-added is 3.0 to 3.6 billion USD. For the agro-industrial parks, the total investment is 2.3 billion USD with total production of 2.1 billion USD and value-added of 0.70 billion USD. Including multiplier effects, the total value-added ranges from 1.2 to 1.5 billion USD or approximately two percent of GDP in 2016 (72.4 billion USD). Public and private investment in industrial and agro-industrial parks may provide a catalyst for future growth by facilitating the transfer of technology and contributing a significant share of export earnings. However, this analysis shows that, even if the plans for these parks are successful, they are likely to provide only a small share of total output and employment in Ethiopia's economy.

Investments in Ethiopia's sugar factories are anticipated to total 5.2 billion USD and results in an estimated annual production of 3.6 billion USD and value-added of 3.3 billion USD, which are 9.4 times the 2014/15 levels of production and value-added. If these targets are achieved, the investments in sugar factories would have a larger effect on GDP than the industrial and agro-industrial parks combined. Including estimated multiplier effects, the total value-added of the planned sugar factories in Ethiopia amounts to between 5.8 and 7.0 billion USD. However, an increase in sugar output of this magnitude would require massive sugar exports that would not necessarily be financially profitable.

CONCLUSIONS

As in most developing countries, Ethiopia's urbanization is driven by various demographic, economic, and political factors: higher net birth rates, rural-to-urban migration, and expanding urban areas contribute to overall urban population growth. The rapid urbanization Ethiopia is experiencing has major implications for structural transformation of the Ethiopian economy – the shift in employment and value-added from agriculture to industry and services. Although, Ethiopia is urbanizing rapidly, its level of urbanization remains behind many other sub-Saharan African countries. Most of Ethiopia's population is still living in rural areas, despite substantial structural change in production and employment.

Much of the expected 56 percent increase in urban population expected in Ethiopia over the next 20 years will likely be in secondary cities. These secondary cities have the potential to play a key role in Ethiopia's future development, as they serve as major regional markets for local agricultural products, help spread the benefits of growth across more of Ethiopia, and contribute to rapid poverty reduction, in part by providing seasonal and full-time employment opportunities for new migrants and for nearby surrounding areas.

Government policy will play a key role in these developments both in terms of overall investment in infrastructure and in macro-economic and trade policies that will have major implications for private sector incentives to invest in Ethiopia's industrial sector. Public and private investment in industrial and agro-industrial parks may provide a catalyst for future economic growth, as well, by facilitating the transfer of technology and contributing a significant share of export earnings. However, they are likely to provide only a small share of total output and employment in Ethiopia's economy.

REFERENCES

Refer to ESSP Working Paper 119 for a full list of references used in this study.

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