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Structural Change in African Countries: Focus on Urban Wages

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Since independence, governments in sub-Saharan African countries have sought industrial diversification, yet agriculture still accounts for nearly half of total employment. While the literature has emphasized slow productivity growth in agriculture and manufacturing, recent evidence reveals patterns inconsistent with this view. Firm-level studies show that, conditional on GDP per capita, urban wages in Africa are significantly higher than in other regions, implying unusually large urban–rural wage gaps. This paper argues, drawing on recent theoretical models, that these wage gaps may signal either limited rural-to-urban labor mobility or strong labor demand in the urban non-tradable sector, both of which can suppress the expansion of the manufacturing sector. Understanding these mechanisms requires closer attention to the urban non-tradable sector—largely composed of informal activities—which is central to explaining Africa's pattern of urbanization without industrialization.

Keywords: industrialization, labor migration, wage gaps, Africa
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Abstract
Since independence, governments in sub-Saharan African countries have sought industrial diversification, yet agriculture still accounts for nearly half of total employment. While the literature has emphasized slow productivity growth in agriculture and manufacturing, recent evidence reveals patterns inconsistent with this view. Firm-level studies show that, conditional on GDP per capita, urban wages in Africa are significantly higher than in other regions, implying unusually large urban–rural wage gaps. This paper argues, drawing on recent theoretical models, that these wage gaps may signal either limited rural-to-urban labor mobility or strong labor demand in the urban non-tradable sector, both of which can suppress the expansion of the manufacturing sector. Understanding these mechanisms requires closer attention to the urban non-tradable sector—largely composed of informal activities—which is central to explaining Africa's pattern of urbanization without industrialization.

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Introduction

Most developed and emerging economies have experienced a shift in the sectoral composition of employment from agriculture to manufacturing and service sectors during sustained growth. Since their independence, sub-Saharan African countries (hereafter "Africa") have prioritized the diversification of their economic structures in their economic policies, yet they have not achieved substantial changes. In terms of employment share, agriculture is the largest sector in sub-Saharan Africa, accounting for 49.0% of employment in 2023 (Figure 1). Over the past 20 years, agricultural employment is slowly shifting to the service sector, which is the second largest in employment, while the employment share of industry remains 11.5% with growth by only 1.4 points. African economies have thus not experienced industrialization yet.

Existing studies have argued that weak productivity growth in agriculture or manufacturing has slowed structural changes in African countries. However, recent studies highlight a particular characteristic of the African labor markets that is not consistent with those accounts. Figure 2 shows a histogram of countries by the ratio of average wage in the manufacturing sector to GDP per capita, based on data from the United Nations Industrial Development Organization (INDSTAT). Among the

non-African countries, the ratio is mostly smaller than 2, and manufacturing wages approximate GDP per capita. In contrast, in most African countries, 9 out of 12, the ratio exceeds 2, with little overlap with the histogram of non-African countries. As we will show in the next section, even after accounting for differences in workers' skills and capital intensity, significant differences in manufacturing wages relative to GDP per capita exist between Africa and other low- and middle-income countries.

Given that GDP per capita approximates the national average income, these comparisons indicate that there are larger gaps between manufacturing wages and rural income in African countries[1]. Recent empirical evidence documents that wage gaps between urban and rural areas are even larger in informal sector than formal sector, and that productivity gaps between agriculture and non-agriculture, which approximate urban-rural wage gaps, are larger in Africa. Although a systematic cross-country comparison of urban-rural wages has not been established yet, we assume throughout this paper greater urban-rural gaps in Africa based on the recent evidence on wage gaps and agricultural productivity gaps.

Despite the prominence of these wage gaps, the existing literature has not systematically examined how Africa's unusually large urban–rural wage differentials shape the pattern of structural transformation. This omission is important because, in basic models of structural change, no urban-rural gaps in real wages remain in equilibrium under the assumption of frictionless labor markets. In those models, growth in consumption or productivity within a sector temporarily generates wage differentials between agriculture and non-agricultural sectors, and workers move across sectors until real wages equalize. Therefore, the large wage gaps observed in Africa suggest the presence of other mechanisms behind the stagnation of structural transformation.

Drawing on the relevant theoretical and empirical studies, this paper examines possible mechanisms of the slow structural changes in Africa that are consistent with the large urban-rural wage gaps. We decompose nominal wage gaps into real wage gaps and differences in prices between urban and rural areas. As we show below, both of the two disparities can be associated with limited rural-to-urban labor migration, resulting in smaller employment in the urban non-agricultural sector. However, given rapid urbanization in Africa, explanations relying solely on limited migration may not be consistent with reality. We therefore introduce three-sector models that distinguish between tradable (manufacturing) and non-tradable (service) sectors within urban non-agriculture, in which migrant workers are induced to work in the non-tradable sector with greater labor demand. In particular, we argue that, under certain assumptions, large urban-rural differences in price levels theoretically reflect

[1] For simplicity, we assume that economies consist of agriculture, manufacturing, and service, and agriculture is located in rural area while the rest two sectors are located in urban area. Also assume that wage in agriculture is lowest. Since GDP per capita approximates the weighted average of wages in the three sectors, a country with higher manufacturing wages relative to GDP per capita also has lower agricultural wages as long as employment shares of three sectors are similar across countries.

strong labor demand in the non-tradable sector relative to manufacturing, which can consistently explain "urbanization without industrialization" (Gollin et al. 2016).

We contribute to the literature by applying research on labor allocation in a process of structural transformation to sub-Saharan African countries and by incorporating high urban wages observed across the continent[2]. While Venables (2017) considers the role of urban wages in Africa's structural transformation, we examine an additional mechanism. We do not aim to provide an exhaustive list of possible mechanisms through which urban-rural wage gaps affect structural change, and rather, we focus on basic mechanisms operating through rural-to-urban labor migration.

Section 1 summarizes the literature on manufacturing sectors in Africa including empirical studies documenting relatively high wages in African firms. Section 2 discusses the theoretical implications of urban-rural gaps in real wages and price levels on labor allocation across the sectors, respectively, drawing on the literature on structural change and labor migration. Section 3 presents relevant empirical evidences. Section 4 discusses mechanisms that generate urbanization without industrialization. The last section concludes and presents a future research agenda. For convenience, we refer to the income of self-employed workers who constitute majority of employment in Africa as wages throughout the paper.

1. Evidence on Nominal Wage Gaps in Africa

The Literature has focused on productivity growth in the manufacturing or agricultural sector to understand the lack of structural change in African countries. Based on the Ricardian model, where a sector with higher productivity has a comparative advantage in small open economies, productivity growth in manufacturing increases its labor demand and induces structural change. Alternatively, in two-sector model with closed economies, faster productivity growth in agriculture reallocates labor from agriculture to manufacturing. Assuming inelastic demand for agricultural products, productivity growth leads to a decline in prices through increased agricultural supply relative to demand and accordingly, a reduction of labor demand in the agricultural sector (e.g. Matsuyama 1992, Gollin, Parente, and Rogerson 2002). Empirical studies show slow productivity growth in both agriculture and non-agriculture in Africa. Post-independence trends in growth of total factor productivity or labor productivity in agriculture have been modest at most (Block 2014, Headey et al. 2010), and among smallholders who are the majority of African farmers, improvement in land productivity has not been observed (Wollburg et al. 2023). In the non-agricultural sector, growth in firm size and total factor productivity was estimated to be very slow or even stagnant (Fraser 2005, Söderbom et al. 2006,

[2] Empirical studies document frictions in labor migration from rural to urban areas, and theoretical models that incorporate frictions have been developed. Donovan and Schoellman (2023) and Lagakos (2020) reviews the relevant studies.

Shiferaw 2007, etc.), and the literature on industrialization in Africa argues the need of industrial policy for productivity growth (Stiglitz et al. 2013).

Recent studies demonstrated that wages in African manufacturing sectors are higher than in other developing countries, conditional on national income levels. Gelb, Meyer, and Ramachandran (2013) compare average wages between 12 African countries and 13 countries in Asia, Latin America, and Eastern Europe using cross-sectional data from 10,502 manufacturing firms in the Enterprise Survey. After accounting for differences in GDP per capita and firm characteristics, they report that wages in African firms are, on average, higher by 38% than in firms in other countries (Gelb, Meyer, and Ramachandran 2013; Table 5). Also, Gelb et al. (2017) using panel data from the same dataset and including firm random effects, show that when controlling for GDP per capita, wages are higher by 39% for small firms and by 52% for medium firms in African countries (Gelb et al. 2017; Table 5)[3]. In labor-intensive industries, wages in export-oriented garment firms in Kenya are on average 1.92 times higher than those in Bangladesh, while their GDP per capita is roughly the same, even after controlling for job type and experience (Fukunishi 2009: Table 6). These studies compare nominal wages (this point is discussed below).

Since labor-intensive industries tend to be located in countries with low wages, low-income countries with high urban wages are likely to lose growth opportunities. For example, in the garment industry, retailers in developed countries outsource production to factories with low production costs around the world. Because they consider transportation time and costs to markets and quality control at factories as well as labor costs, they choose factories with lower costs among countries with business environment that enables specific product quality and logistics. Since quality of the business environment is broadly correlated with average income levels across countries, the comparison of manufacturing wages conditional on GDP per capita indicates the competitiveness of labor-intensive industries (Fukunishi and Yamagata 2014, Gelb et al. 2017).

While the above comparisons are mainly among firms in the formal sector, given the sample structure in the datasets, recent evidence suggests that gaps between urban wages in informal sector and rural income are also large in Africa. De Brauw, Mueller, and Lee (2014) estimate the urban-rural wage gaps in 12 African countries separately for the formal and informal sectors using the International Income Distribution Database. They show that urban wages exceed rural wages in both sectors in all but one country, and that the gaps are larger in the informal sector in seven countries. Since employment in informal sector is not bound by labor regulations and represents the majority of the urban labor markets, this result also suggests that minimum wage is unlikely to account for the urban-

[3] In addition, Lall, Henderson and Venables (2017) extract firms located in cities from the same dataset as above and compare average wages for manufacturing firms in 19 African cities and 38 cities in Asia, Latin America and Eastern Europe. They do not describe the details of their estimation methodology, but they report that nominal wages in sub-Saharan African cities are on average 15% higher, conditional on GDP per capita.

rural wage gaps in Africa[4]. Furthermore, these large wage gaps are not only a recent phenomenon. Literature on the African labor market in the 1960s and 70s also document substantial urban-rural income gaps relative to other developing regions (Mazumdar 2002: Chapters 3 and 6).

Empirical studies on productivity gaps between agriculture and non-agriculture also support the presence of larger wage gaps in African countries. In a competitive labor market, where real wage approximate labor productivity, the differences in labor productivity imply real wage gaps between sectors [5]. Assuming agriculture is predominantly located in rural areas, the productivity gap between agriculture and non-agriculture is closely associated with the urban-rural wage gap (Lagakos 2020). While a number of empirical studies report that agricultural labor productivity is substantially lower than that of other sectors around the world (Casselli 2005, Herrendorf and Shoellman 2018), the recent dataset indicates that these productivity gaps tend to be larger in African countries. Figure 3 indicates agricultural productivity gaps constructed by Gollin, Lagakos, and Waugh (2014), based on improved measurement of sectoral value added and labor inputs. For 17 African countries out of 34, their gaps exceed the 95% confidence interval of the non-African average. While it does not reflect wage gaps arising from price differentials, this suggests that for half of the African samples, their urban-rural gaps in real wages differ substantially from the distribution observed in other countries[6].

In the next and subsequent sections, we show how the urban-rural wage gap can be theoretically interpreted within the mechanisms of structural change and review empirical studies relevant to these interpretations. Throughout our analysis, we decompose urban-rural gaps in nominal wages into differences in real wages and price levels. Specifically, the ratio of urban nominal wages (w^u) to rural ones (w^r) is expressed as follows:

$$\frac{w^u}{w^r} = \frac{w^u/p^u}{w^r/p^r} \cdot \frac{p^u}{p^r} \qquad (1)$$

where p^upu and p^r denote the price level in urban and rural areas, respectively. The first term on the right-hand side is the ratio of real wages, and the second term is the price ratio. In the next section, we summarize the theoretical implications of the real wage gap and the differences in prices.

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[4] In many African countries, minimum wage is close to or lower than the national or international poverty line (Nishiura 2008). Therefore, it is unlikely that minimum wages are set higher than subsistence level in Africa.

[5] Wages equal marginal labor productivity in competitive labor markets, while the productivity gap literature uses average labor productivity. The disparity between the two coincides, for example, when the production functions of agriculture and non-agriculture are Cobb-Douglas and the factor share are identical.

[6] Agricultural productivity gaps may not indicate real wage gaps when labor markets are not competitive; for example, monopsony, minimum wages, efficiency wages and firm-labor negotiations lead to disparity between marginal productivity and wages. For workers in informal sector, however, labor regulations are not generally applied.

2. Urban-rural wage gap and labor migration

2.1. Gaps in Real Wages

The productivity gap between agriculture and non-agriculture implies, from a macroeconomic perspective, inefficient allocation of labor across sectors. If rural and urban workers are homogeneous, a point that will be discussed later, reallocating labor from agriculture to non-agriculture would increase overall labor productivity in the economy. Under the assumption of diminishing marginal labor productivity, the optimal allocation is achieved when labor productivity is equalized across the industries through labor migration pursuing higher wages in the non-agricultural sector. Therefore, unless additional assumptions are introduced, the large productivity gap between industries indicates that rural-to-urban labor mobility is substantially restricted and growth of employment in the urban non-agricultural sectors is limited. In other words, non-agricultural sector has potential to grow even without productivity growth.

It is noted that in a two-sector model with a closed economy, agricultural employment becomes larger when productivity is lower relative to non-agricultural. Under the standard assumption of inelastic demand for agricultural products, the model indicates that in countries with low agricultural productivity, more workers must be employed in agriculture to satisfy inelastic food demand (Schultz 1953) [7]. However, since labor is assumed to move freely between sectors in the standard closed economy model, an urban-rural wage gap indicates that more labor is employed in agriculture than is needed to maintain food supply. Restuccia, Yang, and Zhu (2008), through calibrations of a closed economy model, show that the share of agricultural employment is affected by labor mobility frictions as well as agricultural productivity.

The Harris-Todaro model does not adequately account for the empirically observed urban-rural wage gaps. While it explains higher urban wages in the formal sector than rural income based on inflexible wage setting, its core mechanism assumes that rural-urban migration equalizes rural income with expected urban income. Under this assumption, the average urban wage including formal and informal sectors must equal the average rural income, given that the informal sector is modeled as a subsistence activity. However, as discussed earlier, substantial wage gaps are observed between rural and urban informal sector as well as urban formal sector in many African countries. These empirical patterns imply that average urban wages exceed rural incomes, contradicting the equilibrium condition implied by the Harris-Todaro framework[8]. Similarly, other mechanisms that raise urban wages, such

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[7] This is Baumol effect (Baumol 1967). See Ngai and Pissarides (2007) for mechanisms of structural change through productivity growth.

[8] A few studies based on household surveys also show large gaps in household income and consumption. Henderson and Kriticos (2019) compare urban and rural household incomes in Tanzania, Uganda, and Nigeria. After controlling for household size and education of household head, the study reports that household income in the largest cities (Dar es Salaam, Kampala, and

as efficiency wage and search costs would not generate wage gaps, as long as they are not relevant in the informal labor market.

The gaps in labor productivity can also be explained by differences in the skills of workers in agriculture and non-agriculture. When higher skills are needed in the non-agricultural sector, skilled workers move to cities for non-farm employment, while less-skilled workers remain in rural areas. Skill-based choice of location (skill sorting) generates urban-rural wage gaps. Young (2013), using the household surveys from 65 countries, finds that labor migration is bidirectional with substantial mobility from urban to rural and that migration to cities is dominated by better-educated workers than those migrating in the opposite direction. He argues that such skill sorting accounts for the urban-rural consumption gaps, demonstrating that they are correlated with skill gaps across countries.

The recent empirical studies have attempted to identify the impact of skill sorting on wage differentials by estimating the wage changes experienced by workers who moved from rural to urban areas, assuming that they represent urban-rural wage gaps for workers with the same skills. In the studies in Indonesia and Brazil, wage changes for workers who have moved are small, suggesting that the urban-rural wage gap is generated by skill sorting (Hicks et al. 2017, Alvarez 2020). On the other hand, Lagakos et al. (2020) report substantial changes in per capita consumption through labor mobility in the countries including Ghana, South Africa, and Tanzania. An intervention providing cash equivalent to the cost of migration show that household consumption rises by 33% for rural households in Bangladesh whose members migrated to the cities (Bryan, Chowdhury, and Mobarak 2014). While the empirical results on the urban-rural wage gap are mixed, Lagakos et al. (2020) argue that wage changes of migrated workers may understate wage gains from migration in regions with lower rural-urban migration, and therefore, moderate wage changes may still suggest frictions in labor migration in lower-migration regions.

Alternative explanations of wage differentials include compensation for the costs of moving to cities. Such costs include migration costs and compensating differentials for the utility loss stemming from lower amenities in cities and the risk of losing land-use rights in villages. Furthermore, information frictions between cities and villages could restrict migration opportunities of rural farmers by raising the costs of information on urban employment, resulting in suboptimal migration and wage gaps. In the next section, we will review empirical studies in Africa.

Several studies have analyzed the impact of labor reallocation on macroeconomic performance through simulations of general equilibrium models. Tombe (2015) estimates changes in overall labor productivity when frictions in labor mobility between three sectors (agriculture, tradable

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Lagos) is higher by 69-134% than that of rural households. Based on Demographic and Health Survey, Gollin, Kirchberger, and Lagakos (2021) also found marked differences in durable goods consumption and house quality between households in the most populated regions (the first quartile) and the least ones (the fourth quartile) in 20 African countries.

goods, and non-tradable goods) are lifted. He shows that in the countries in the bottom 10% of income levels, removing mobility frictions raises overall labor productivity by 65% in an open-economy framework. Since frictions are greater in low-income countries, his estimates suggest that they account for 14% of the productivity gap between the countries in the bottom 10% and the top 10% of income levels. Święcki (2017) also incorporates imperfect labor mobility into a trade model with 16 sectors and demonstrates that household consumption rises by 60% on average in low-income countries if frictions are removed.

Tombe's simulations indicate that the impacts of lifting friction in labor mobility vary with by trade costs and frictions in factor substitution. In an autarky, the reduction of domestic farmers causes a sharp rise in agricultural prices and wages, given minimum food requirements. The increase in wages is even sharper when substitution between labor and capital in agriculture is absent. Therefore, in a country with high trade and capital costs, wages in agriculture and non-agriculture are equalized quickly after friction is removed, and therefore, a smaller labor flow out of agriculture is induced[9].

2.2 Price Differences between Urban and Rural Areas

Even when real wages are equalized, nominal wages may differ between two areas due to differences in price levels. As equation (1) shows, the smaller the real wage gap ($\frac{w^u/p^u}{w^r/p^r}$ is close to 1), the more the price difference, ($\frac{p^u}{p^r}$), approximates the nominal wage gap. Therefore, given equalization of real wages, the economies with greater urban-rural price differences will exhibit larger nominal wage gaps in equilibrium. Then, if price differences decline, the urban *real wage* relative to the rural one rises, inducing migration from villages to cities. In a simple model in which migration is driven by differences in real wages, large price differences between urban and rural areas reduce rural-to-urban migration.

The literature in urban economics considers urban cost-of-living in migration decisions (Brueckner and Lall 2015). The standard urban model assumes that urban dwellers need to bear higher housing costs and pay transportation costs to commute to the city center, whereas these costs are generally lower or zero for rural residents. It incorporates a mechanism whereby commuting costs in cities affect urban population (and thus labor supply) through housing supply in a city as well as demand for labor migration. In Venables (2017), homogenous workers choose to migrate to a city based on a comparison of rural income and urban wages net of housing and commuting costs, which vary with distance from the city center. In equilibrium, urban real income is equal to rural one and

[9] Restuccia, Yang and Zhu (2008) examines labor reallocation when high capital costs due to poor financial markets prevent the substitution of labor for capital.

thus, constant within a city, while nominal urban income is higher by commuting and housing costs. Since commuting costs increases further from the center, housing prices fall accordingly given constant income. Therefore, in cities with high commuting costs, housing prices quickly fall as being away from the center, resulting in a small city size due to limited housing supply. In addition to affecting worker's returns to migration, high urban prices due to high commuting costs reduce urban population through housing supply.

Since a nominal wage gap does not imply inefficient labor reallocation as long as real wages are equalized between urban and rural areas, labor mobility followed by falling urban prices does not necessarily increase overall labor productivity. However, when the manufacturing sector exhibits economies of scale, as often assumed in the industrialization literature, labor migration driven by relative price changes necessarily raises labor productivity in manufacturing, leading to a new equilibrium with a larger share of manufacturing employment.

Empirical studies on urban and rural prices in Africa remain limited, although a few compare price levels between Africa and other developing regions. Gelb and Diofasi (2015) compare price levels in 168 countries using purchasing power parity rates produced by the International Comparison Program (ICP) and found that prices in African countries are higher by 15% on average and by 21% among low- and middle-income countries, after controlling for GDP per capita. A study focusing on urban prices has shown similar results; Nakamura et al. (2016) used the ICP's Price Level Index to construct urban prices and compared cities in 62 developing countries. After accounting for per-capita income and urban population, they report that urban prices in African countries are 22.4-30.6% higher than in other regions. Prices of non-tradable goods are particularly high, including transportation, rent and utilities, and perishable foods. It also documents variations within Africa: Angola, Democratic Republic of Congo, Mozambique, Malawi, and Chad have the highest price levels, while Gambia, Mauritius, Madagascar, and Tanzania have the lowest.

Lall, Henderson, and Venables (2017) analyzes land use and transportation infrastructure in African cities, using spatial data in developing countries. They argue that, compared with cities in other regions, African cities are sparse and spread outward with poor connectivity, resulting in congestion, high travel costs and limited agglomeration benefits.

3. Labor Migration in African Countries

An increasing number of studies have analyzed changes of employment share across sectors to understand the contribution of labor reallocation to aggregate productivity growth. McMillan, Rodrik, and Verduzco-Gallo (2014) estimates changes in employment shares across 10 sectors in 38 countries including those in Africa. In the 1990s, in contrast with the pattern in Asian countries, employment in African countries shifted from more productive sectors to less productive ones, and only after 2000

did employment begin to move in the opposite way. Enache et al. (2021) show that while some African countries which achieved high economic growth, such as Mauritius and Botswana, experienced a transition of labor out of agriculture in the 1970s, this shift occurred only after the 1990s in many of the low-income African countries. Furthermore, among the late starters, labor tends to move to service sectors, in which labor productivity is lower than in manufacturing. These studies indicate that prior to the 2000s, the supply of labor to the non-agricultural sector was limited, suggesting that productivity gaps between agriculture and non-agriculture did not narrow until recently.

Recent studies provide the evidence on barriers to labor migration in Africa. Gollin, Kirchberger, and Lagakos (2021) test a hypothesis that disutility of urban life stemming from congestion, environment degradation, and insecurity could justify an urban-rural wage gap as compensating wages. Thery compare public infrastructure, provision of health and educational facilities, crime rates, and air pollution in 20 African countries and find higher quality of urban amenities on most indicators [10]. For example, air pollution is not more serious in cities because many rural areas, particularly in the Sahel region, suffer from dust. Those results do not support the possibility the wage gaps in Africa represent compensating wages.

A few empirical studies analyze the migration decisions of rural households. Baseler (2023) reports that migrant workers in Kenya underreport the income they earn in Nairobi to their families in villages in order to reduce remittance obligations. It also shows that such underreporting discourages migration among rural household members. Gottlieb and Grobovšek (2019) argues that migration to cities is risky for farmers under communal land tenure, since they may lose land use rights when they stop cultivating by themselves and renting it out. They calibrate a general equilibrium model incorporating communal land tenure using Ethiopian data and then estimate the changes in agricultural employment that would occur if communal tenure is lifted and property right is secured. Their simulations show that the establishing property rights motivates less productive farmers to migrate, resulting in a decrease of agricultural employment by 18 percentage points and narrowing the productivity gap between agriculture and non-agriculture by half.

While rural-to-urban migration was likely limited until the 1990s, the evidence on sectoral employment changes indicates that substantial number of workers moved out of agriculture after the 2000s (McMillan, Rodrik, and Verduzco-Gallo 2014, Enache et al. 2020). Accordingly, rapid urbanization is reported in Africa; for example, the UN Department of Economic and Social Affairs reported that the urbanization rate in Africa rose from 23% in 1970 to 43% in 2018 and is projected to reach 59% in 2050 (UN Department of Economic and Social Affairs 2018). A simple comparison of

[10] When comparing urban and rural statistics, definitions of urban and rural areas are always an issue. Most studies follow administrative definitions, which occasionally change and are not strictly based on population density. Gollin, Kirchberger and Lagakos (2021) define the urban-rural distinction by population density.

urbanization rates in World Development Indicators data shows that it is lower in Africa by only 4.2 percentage points than in other low- and middle-income countries, conditional on per capita GNI [11]. Although we should note that the definition of an urban area varies across country (Lucas 2015), the relevant data suggest that recent migration is not far slower in Africa than in other developing regions.

Thus, it is reasonable to assume that limited labor migration does not fully account for the current differences in sectoral employment shares between Africa and the other developing regions, and instead, reallocation of labor from agriculture to the service sector plays a major role. The next section discusses mechanisms of urbanization without industrialization (Gollin et al. 2016).

4. Urbanization without Industrialization

Models that incorporate multiple sectors within cities describe mechanisms by which rural-to-urban labor migration does not necessarily lead to industrialization. Venables (2017) introduces tradable and non-tradable sectors in cities, where the tradable sector faces elastic world demand at fixed world prices. As a result, labor demand curve in the tradable sector is horizontal under constant returns to scale, whereas the one in the non-tradable sector is downward sloping. Combining these two demand curves, the urban labor demand curve is depicted in a kinked shape (Figure 4). When the urban wage determined by the intersection with the labor supply curve exceeds w_0 (e.g., w_1), only non-tradable goods are produced, and when it coincides with w_0, production of tradables starts. By incorporating comparative advantages in the tradable sector, the model describes a threshold level of urban labor supply that triggers industrialization. Thus, moderate migration that keeps urban labor supply below this threshold does not lead to industrialization but drives growth of the urban population [12].

In Hashiguchi and Fukunishi (2021), workers decide migration based on expected utility in cities, where they can work either of two tradable sectors, land-intensive (agriculture) and labor-intensive (non-agriculture) ones with bearing commuting costs [13]. Since high commuting costs discourage rural workers from migrating, in a country with higher commuting costs, the urban labor supply is smaller, and wage is higher relative to land prices. In a two-country setting with free trade, a country with high commuting costs has a comparative advantage in agriculture, and consequently lags behind in industrialization. This model highlights a mechanism that urban costs influence sectoral employment structure through factor endowment in urban areas.

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[11] Average of urbanization rates over 2014-22 for 76 countries are compared.

[12] Venables (2017) considers a case of increasing returns to scale in tradable production, in which multiple equilibria exist; in one of equilibria, firms coordinate their entry into the tradable sector and realized agglomeration effects allow those firms to supply at the world prices paying high urban wages. He argues that policies to form firms' belief that the sector grows through agglomeration effects are important to reach the equilibrium leading to industrialization.

[13] Commuting costs are included in the utility function as a disutility rather than monetary costs. However, it can be interpreted that commuting costs depreciate consumption.

These models incorporate a mechanism whereby labor demand for manufacturing is determined by comparative advantage, which realizes only when urban labor supply is sufficiently large. Therefore, moderate urbanization does not lead to growth in manufacturing employment, while employment grows in urban service or agricultural sector. Such discontinuous relationship between urban labor supply and manufacturing employment in the models appears consistent with the large differences in manufacturing employment between Asia and Africa relative to differences in urbanization. Those models are also consistent with the existence of a large informal sector in African cities, in which most workers engage in services and agriculture.

It should be noted that the model's implications require that urban labor market is integrated between the formal and informal sectors. While traditionally informal jobs have been viewed as subsistence for those workers unable to find formal employment, recent studies show bidirectional mobility of workers and overlap of wage distributions across sectors, indicating integrated labor markets at the margin (Maloney 2004, Ulyssea 2018, etc.). Empirical studies in Africa report that wages of unskilled workers in labor-intensive industries are often comparable with alternative income in the informal sector, supporting that wages in the informal sector and the low-end formal sector are associated [14].

The models discussed above, however, still rely on relatively small labor migrations to limit industrialization. We can think of a mechanism that high urban prices and large employment in the non-tradable sector, thus small tradable employment can be compatible, when some non-tradable goods are predominantly consumed by urban households. Prices of non-tradable goods are more likely to differ across countries than tradables, and thus generate differences in urban prices. Some non-tradable goods, for example, transportation services, water and electricity supply, household services, and child care services, are less frequently purchased by rural households and can be an important source of urban-rural price differences. If the elasticity of substitution for those non-tradables is low, their relative prices are negatively correlated with relative productivity; prices of non-tradables are higher than those of tradables when productivity in the non-tradable sector is lower. Thus, poor performance in the service sector supplying mainly to urban households generates an urban-rural gap in nominal wages and reduces the supply of labor to cities.

Furthermore, through the Baumol effect, lower productivity in the non-tradable sector producing necessities is associated with larger *nominal* consumption of non-tradables by urban households, and accordingly, greater labor demand in the sector. As a result, the share of employment in the urban tradable sector is smaller. This can be illustrated in Venable's model, in which an upward

[14] Unskilled factory workers often work longer hours and earn comparable wages with self-employed workers. For example, an intervention in Ethiopia that randomly provided the youth with either the resources, capital and training, to start micro-business or factory employment did not show significant earnings differences between the two groups (Blattman and Dercon 2018).

shift of the labor demand curve of non-tradables reduces employment in the tradable sector and raises the equilibrium wage above w_0 (Figure 5). Because these changes are independent of labor migration, they realize urbanization without industrialization [15]. Vanino and Lee (2018) tests the hypothesis that prices of non-tradable goods are higher in countries with poor quality of institutions through lowering productivity in the sector. They show that the quality of governance and business environment is negatively correlated with non-tradable prices in middle- and low-income countries.

Labor demand in the non-tradable sector also expands when demand for goods increases. Gollin, Jedwab, and Vollrath (2016) examine the hypothesis that when domestic demand grows by resource rents, labor demand in the non-tradable sector grows relative to the tradable sector in resource-rich countries. In their model, agriculture is located in rural areas and tradable and non-tradable sectors are located in urban areas, each using only labor for production. Labor moves freely among the three sectors and wages are equalized. Household utility is determined by consumption of the three goods, with non-homothetic preference for agricultural products. When natural resource exports increase, through income effect, demand for urban tradable and non-tradable goods increases relative to agricultural products (resource production and consumption are abstracted). Because increased tradable demand is satisfied by imports, labor demand rises more sharply in the non-tradable sector, shifting labor from agriculture and the urban tradable sector to the non-tradable sector. Although the model does not incorporate nominal wage gaps, it demonstrates an alternative mechanism through which the demand for labor in the non-tradable goods sector increases.

5. Conclusion: Approaches to the urban informal sector

The theoretical models discussed in this paper show that the urban-rural wage gap reflects the state of labor supply and demand in the urban non-agricultural sectors; specifically, labor migration out of agriculture in rural areas and labor demand in the non-tradable sector in cities. We divide nominal gaps into differences in real wages and price levels between urban and rural areas.

When gaps of real wages are substantially large, they indicate that supply of labor in a non-agricultural sector located in cities is suboptimal due to frictions in rural-to-urban migration, unless skill sorting or compensating wage fully accounts for the gap. Urban-rural price differences also limit the size of labor migration motivated by the real wage differentials through reducing urban real wages relative to rural ones. The impact of limited labor supply on non-agricultural employment is likely to be substantial in low-income countries, which tend to have a comparative advantage in labor-intensive industries, and face high trade and capital costs.

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[15] Note that the Baumol effect in this mechanism is caused by productivity changes but not by urban-rural price differences. It is a result of our assumption of higher expenditure of non-tradable goods for urban households, and not incorporated in standard models of structural changes.

However, the recent trends of increasing labor migration out of agriculture to the urban service sector in Africa, it is not convincing to attribute slow industrialization solely to insufficient labor migration. Some models incorporate multiple urban sectors, tradable and non-tradable sectors, where the growth of tradable sectors depends on comparative advantages in labor-intensive goods. These models show that industrialization occurs only when urban labor supply exceeds a threshold that allows the tradable sector to operate at internationally competitive wages. If urbanization remains moderate due to migration frictions or price differences and the threshold is not reached, urban wages remain high and most employment is absorbed by non-tradable activities.

Nominal wage gaps can also be associated with labor demand in a non-tradable sector. Through the Baumol effect, lower productivity in a non-tradable sector is associated with higher price of non-tradables and larger labor demand in the sector, thus less employment in the tradable sector, when elasticity of substitution is low. If those non-tradables are consumed more intensively by urban households, high non-tradable prices generate urban-rural gaps in nominal wages. Absorption of urban labor in the non-tradable sector is strengthened when large external income, such as resource exports or aid, is available, because increased consumption exclusively induces labor demand in the non-tradable sector while tradables are imported. Thus, prices of non-tradable goods, especially those consumed primarily in cities, may influence industrial structure through both labor demand and supply in cities. When the labor-demand channel is strong, it depresses the relative size of employment in the tradable sector even without constraints on labor migration, leading to a pattern of urbanization without industrialization.

Given the ongoing rapid urbanization in African cities, recent theoretical studies suggest that the urban non-tradable sector is a key to understanding slow structural change. This stands in a sharp contrast to the existing literature on African industrial development, which has focused primarily on the urban tradable sector. The recent studies incorporate interactions between the tradable and non-tradable sectors into the analytical framework, showing that employment in the tradable sector grows after labor demand in the non-tradable sector is filled. Therefore, in a country where the urban labor supply is small or labor demand in the non-tradable sector is large, employment in the tradable sector remains small. This analytical framework is relevant when labor markets of the two sectors interact sufficiently.

With the exception of a few countries such as South Africa and Mauritius, non-tradable goods in sub-Saharan Africa are predominantly produced in the informal sector. Evaluating the validity of the analytical models accounting for urbanization without industrialization therefore requires a deeper understanding of labor markets and micro-firms in the informal sector. In particular, future research needs to clarify the mechanisms that sustain the large informal sector in most African cities. Understanding these mechanisms will provide insights into the prospects for structural change in Africa, especially in light of the expanding use of digital services for communication, marketing, and

finance among micro entrepreneurs and workers.

Reference

Adenikinju, Adeola, Ludvig Södering, Charles Soludo and Aristomène Varoudakis 2002. "Manufacturing Competitiveness in Africa: Evidence from Cameroon, Cote d'Ivoire, Nigeria, and Senegal," *Economic Development and Cultural Change*, Vol.50, No.3.

Alvarez, Jorge A. 2020. "The Agricultural Wage Gap: Evidence from Brazilian Micro-data." *American Economic Journal: Macroeconomics* Vol.12, No.1, pp. 153–73.

Baseler, Travis 2023. "Hidden Income and the Perceived Returns to Migration," *American Economic Journal: Applied Economics*, Vol.15, No.4, pp. 321-352.

Baumol, William J. 1967. "Macroeconomics of Unbalanced Growth: The Anatomy of Urban Crisis," *American Economic Review*, Vol.57, No.3, pp. 415–426.

Blattman, Christpher and Stefan Dercon 2018. "The Impacts of Industrial and Entrepreneurial Work on Income and Health: Experimental Evidence from Ethiopia," *American Economic Journal: Applied Economics*, Vol. 10, No.3, pp. 1-38.

Block, S. 2014. "The Post-independence Decline and Rise of Crop Productivity in Sub-Saharan Africa: Measurement and Explanations," *Oxford Economic Papers*, Vol.66, No.2, pp. 373–96.

Bryan, Gharad, Shyamal Chowdhury, and Ahmed Mushfiq Mobarak. 2014. "Underinvestment in a Profitable Technology: The Case of Seasonal Migration in Bangladesh," *Econometrica*, Vol.82, No.5, pp. 1671–1748.

Brueckner, Jan K., and Somik Lall 2015. "Cities in Developing Countries: Fueled by Rural-Urban Migration, Lacking in Tenure Security, and Short of Affordable Housing," in G. Duranton, J.V. Henderson and W. Strange eds., *Handbook of Regional and Urban Economics Volume 5B*, Elsevier, pp. 1399-1455.

Caselli, Francesco. 2005. "Accounting for Cross-Country Income Differences." In Philippe Aghion and Steven N. Durlauf eds., *Handbook of Economic Growth*, Amsterdam: Elsevier, pp. 679–741.

Diao, Xinshen, Margaret McMillan and Dani Rodrik 2019. "The Recent Growth Boom in Developing Economies: A Structural-Change Perspective," in M. Nissanke and J.A. Ocampo eds., *The Palgrave Handbook of Development Economics*, Palgrave McMillan.

Donovan, Kevin and Todd Schoellman 2023. "The role of labor market frictions in structural transformation," *Oxford Development Studies*, Vol.51, No.4, pp. 362-374.

de Brauw, Alan, Valerie Mueller, and Hak Lim Lee 2014. "The Role of Rural-Urban Migration in the Structural Transformation of Sub-Saharan Africa," *World Development*, Vo. 63, pp.33-42.

Eifert, Benn, Alan Gelb and Vijaya Ramachandran 2005. "Business Environment and Comparative Advantage in Africa: Evidence from the Investment Climate Data," Working Paper No. 56, Center

for Global Development.

Enache, Maria, Ejaz Ghani, Stephen O'Connell 2016. "Structural Transformation in Africa: A Historical View," Policy Research Working Paper 7743, World Bank.

Frazer, Garth 2005. "Which Firms Die? A Look at Manufacturing Firm Exit in Ghana," *Economic Development and Cultural Change*, Vol.53. No.5, pp585-617.

Fukunishi, Takahiro 2009, "Has Low Productivity Constrained the Competitiveness if African Firm? A Comparison of Kenyan and Bangladeshi Garment Firms," *Developing Economies*, Vol. 47, No.3, pp. 307-339.

Fukunishi, Takahiro and Tatsufumi Yamagata 2014. "Introduction: The Dynamism of the Garment Industry in Low-income Countries," in *The Garment Industry in Low-income Countries: An Entry Point of Industrialization*, edited by T. Fukunishi and T. Yamagata, pp. 1- 37, Basingstoke: Palgrave Macmillan.

Gelb, Alan and Anna Diofasi 2015. "What Determines Purchasing-Power Parity Exchange Rates?", CGD Working Paper 416, Washington D.C.: Center for Global Development.

Gelb, Alan, Christian Meyer, and Vijaya Ramachandran 2013. "Does Poor Mean Cheap? A Comparative Look at Africa's Industrial Labor Costs," CGD Working Paper 325, Center for Global Development.

Gelb, Alan, Christian Meyer, Vijaya Ramachandran and Divyanshi Wadhwa 2017. "Can Africa be a Manufacturing Destination? Labor Costs in Comparative Perspective, CGD Working Paper 466, Washington D.C.: Center for Global Development.

Gollin, Douglas, Remi Jedwab, and Dietrich Vollrath 2016. "Urbanization with and without Industrialization," *Journal of Economic Growth*, 21, pp. 35-70.

Gollin, Douglas, Martina Kirchberger, and David Lagakos 2021. "Do Urban Wage Premia Reflect Lower Amenities? Evidence from Africa," *Journal of Urban Economics*, 121.

Gollin, Douglas, David Lagakos, and Michel E. Waugh 2014. "The Agricultural Productivity Gap," *Quarterly Journal of Economics*, Vol.129, No.2, pp. 939-993.

Gollin, Douglas, Stephen L. Parente, and Richard Rogerson 2002. "The Role of Agriculture in Development," *American Economic Review,* Vol.92, No.9, pp. 160-4.

Gottlieb, Charles, and Jan Grobovšek 2019. "Communal Land and Agricultural Productivity," *Journal of Development Economics*, Vol.138, pp. 135-152.

Harris, John R., and Michael P. Todaro. 1970. "Migration, Unemployment and Development: A Two Sector Analysis." *American Economic Review,* Vol.60, No.1, pp. 126–42.

Hashiguchi, Yoshihiro and Takahiro Fukunishi 2021. Trade, Commuting Costs and Structural Transformation, mimeo, Chiba: Institute of Developing Economies.

Headey, Derek, Mohammad Alauddinb, and D.S. Prasada Rao 2010. "Explaining agricultural productivity growth: an international perspective," *Agricultural Economics*, Vol.41, No.1, pp. 1–14.

Henderson, J. Vernon and Sebastian Kriticos 2018. “The Development of the African System of Cities,” *Annual Review of Economics*, 10, pp. 287–314.

Herrendorf, Berthold, and Todd Schoellman. 2018. “Wages, Human Capital, and Barriers to Structural Transformation.” *American Economic Journal: Macroeconomics,* Vol.10, No.2: 1–23.

Hicks, Joan Hamory, Marieke Kleemans, Nicholas Y. Li, and Edward Miguel. 2017. “Reevaluating Agricultural Productivity Gaps with Longitudinal Microdata.” NBER Working Paper 23253.

Lagakos, David 2020. “Urban-Rural Gaps in the Developing World: Does Internal Migration Offer Opportunities?,” *Journal of Economic Perspectives*, Vol.34, No.3, pp. 174–192.

Lagakos, David, Samuel Marshall, Ahmed Mushfiq Mobarak, Michael E. Waugh, and Corey Vernot 2020. “Migration Costs and Observational Returns to Rural-Urban Migration.” *Journal of Monetary Economics*, Vol.113, pp. 138-154.

Lagakos, David and Michael E. Waugh 2013. “Selection, Agriculture and Cross-country Productivity Differences,” *American Economic Review*, Vol. 103, No.2, pp.948-980.

Lall, Somik Vinay, J. Vernon Henderson and Anthony J. Venables 2017. *Africa’s Cities: Opening Doors to the World*, Washington D.C.: World Bank.

Lucas, Robert E. 2015. “Internal Migration in Developing Economies: An Overview,” KNOMAD Working Paper 6, World Bank.

Maloney, William F. 2004. “Informality revisited,” *World Development*, Vol.32, No.7, pp. 1159−1178.

Matsuyama, Kiminori 1992. “Agricultural Productivity, Comparative Advantage, and Economic Growth,” *Journal of Economic Theory*, Vol. 58, pp. 317-334.

Mazumdar, Dipak 2002. *Wages and Employment in Africa*, Aldershot, Ashgate Publishing.

McMillan, Margaret, Dani Rodrik and Íñigo Verduzco-Gallo 2014. “Globalization, Structural Change, and Productivity Growth with an Update on Africa,” *World Development*, Vol. 63, pp.11-32.

Nakamura, Shohei, Rawaa Harati, Somik V. Lall, Yuri M. Dikhanov, Nada Hamadeh, William Vigil Oliver, Marko Olavi Rissanen, Mizuki Yamanaka 2016. “Is Living in African Cities Expensive?” Policy Research Working Paper 7641, World Bank.

Ngai, L. Rachel and Christopher A. Pissarides 2007. “Structural Change in a Multisector Model of Growth,” *American Economic Review*, Vol.9, No.1, pp. 429–443.

Restuccia, Diego, Dennis Tao Yang, and Xiaodong Zhu 2008. “Agricultural and Aggregate Productivity: A Quantitative Cross-Country Analysis,” *Journal of Monetary Economics*, Vol. 55, pp. 234-250.

Schultz, T.W 1953. T*he Economic Organization of Agriculture*, New York: McGraw-Hill.

Shiferaw, Admasu 2007. “Firm Heterogeneity and Market Selection in Sub-Saharan Africa: Does It Spur Industrial Progress?” *Economic Development and Cultural Change*, Vol.55, No.2, pp.393-423.

Stigliz, Joseph E., Justin Lin Yifu and Ebrahim Patel 2013. *The Industrial Policy Revolution II: Africa in the 21st Century*, Basingstoke: Palgrave Macmillan.

Święcki, Tomaz 2017. “Intersectoral Distortions and the Welfare Gains from Trade,” *Journal of International Economics*, Vol. 104, pp. 138-156.

Tombe, Trevor 2015. “The Missing Food Problem: Trade, Agriculture, and International Productivity Differences,” *American Economic Journal: Macroeconomics*, Vol.7, No.3, pp. 226-258.

Ulyssea, Gabriel 2018. Firms, informality, and development: Theory and evidence from Brazil. *American Economic Review*, Vol.108, No.8, pp. 2015–2047.

UN Department of Economic and Social Affairs 2019. *World Urbanization Prospects: The 2018 Revision*, New York: United Nations.

UN Habitat 2014. *The State of African Cities 2014*, United Nations Human Settlements Programme (UN-Habitat).

Vanino, Enrico and Stevan Lee 2018. “Extractive Institutions in Non-tradable Industries,” *Economics Letters*, Vol.170, pp. 10-13.

Venables, Anthony J. 2017. “Breaking into Tradables: Urban Form and Urban Function in a Developing City,” *Journal of Urban Economics*, Vol. 98, pp.88-97.

Wollburg, Philip, Thomas Bentze, Yuchen Lu, Christopher Udry, and Douglas Gollin 2023. “Agricultural Productivity Growth in Africa: New Evidence from Microdata,” World Bank.

Young, Alwyn 2013. “Inequality, the Urban-rural Gap, and Migration,” *Quarterly Journal of Economics*, Vol. 128, No.4, pp. 1727-1785.

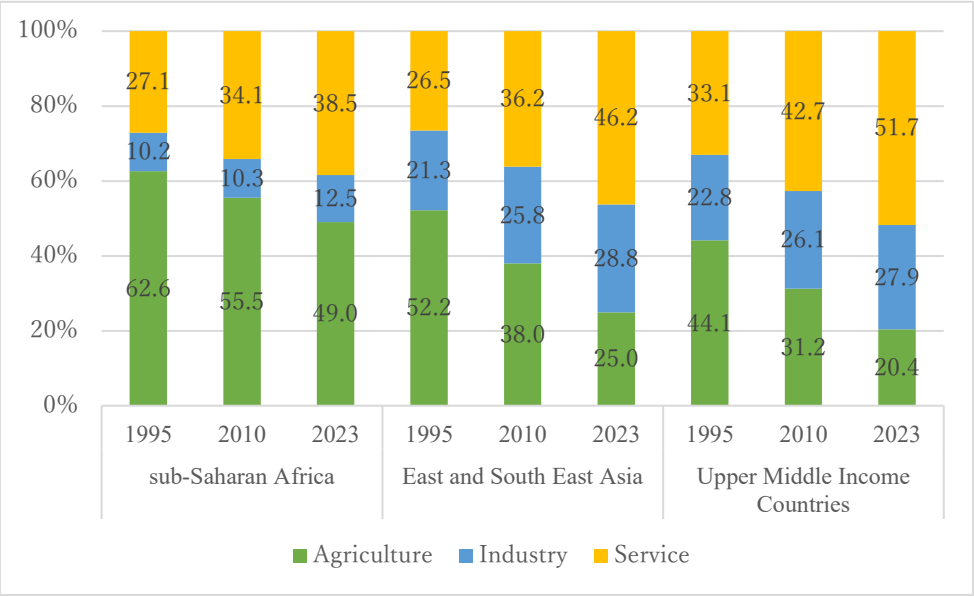

Figure 1: Employment Share by Industry (%)

Source: World Development Indicators

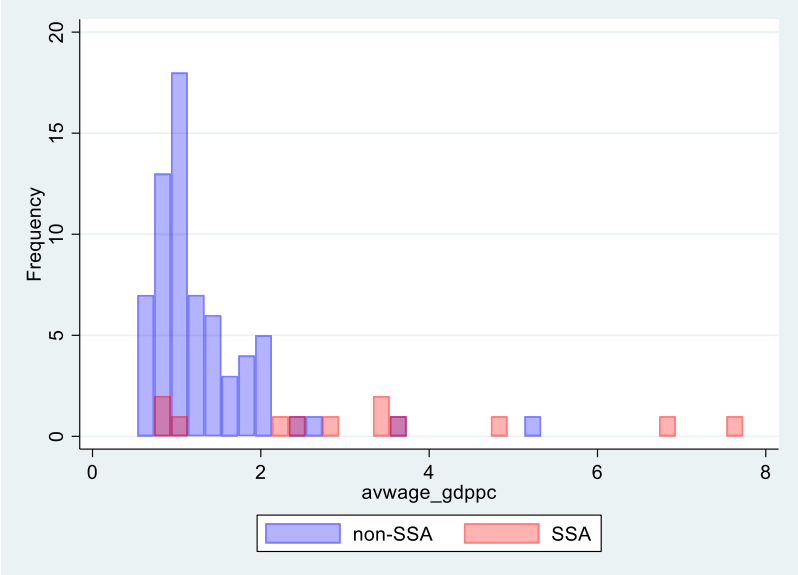

Figure 2. Average manufacturing wages as a percentage of GDP per capita

Note: The figures are averages for 2012-2022 (excluding missing values) for 79 countries including 12 sub-Saharan African countries with a GDP per capita of less than $20,000.

Source: INDSTAT and World Development Indicators

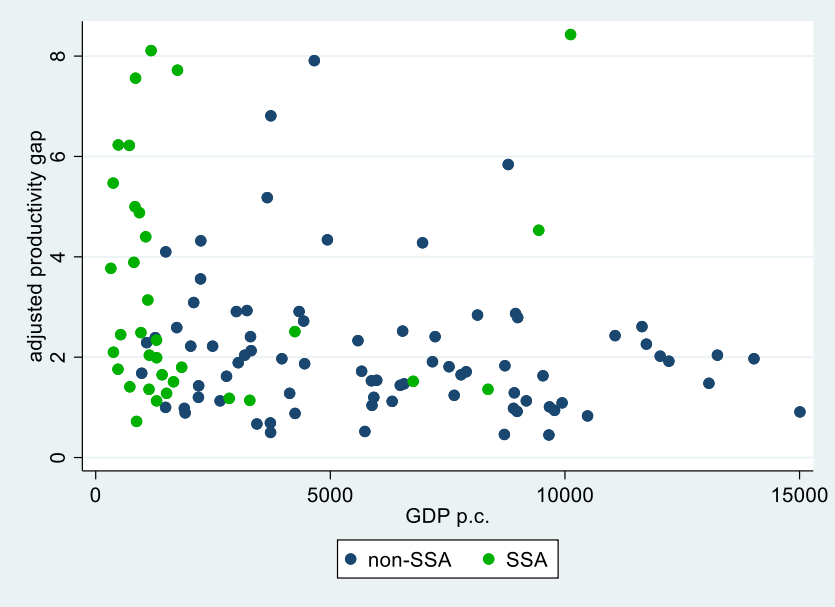

Figure 3. Agricultural Productivity Gaps

Note: Data are from Gollin, Lagakos and Waugh (2014). Imputed agricultural productivity gaps are shown for 113 countries excluding the countries in the bottom quantile for GDP per capita.

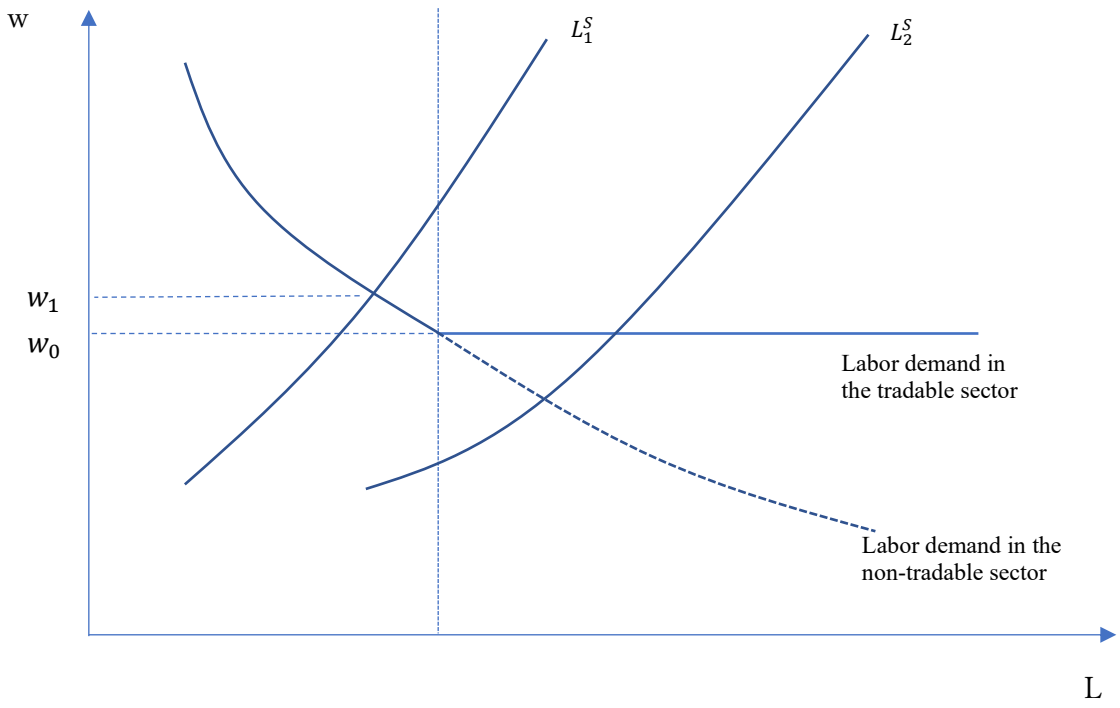

Figure 4. Urban labor market in Venables (2017)

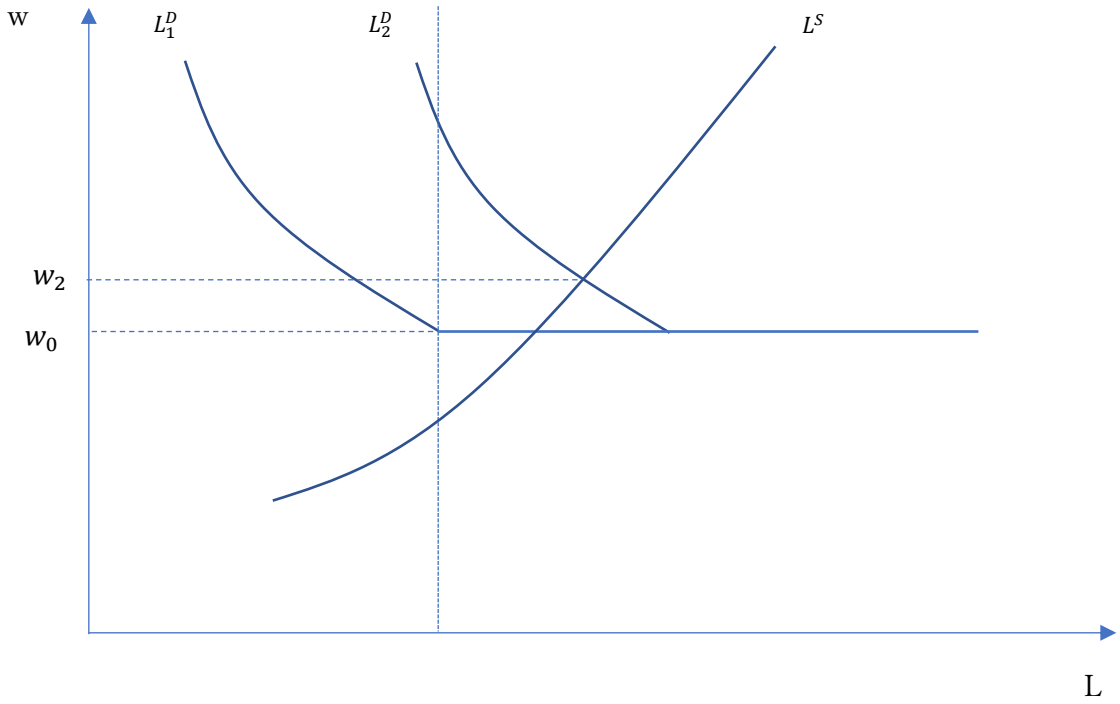

Figure 5. Changes in labor demand in the non-tradable sector