The Urban Wage Premium in Africa

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Abstract:

This paper examines the size and sources of the urban wage premium in three African countries—Nigeria, Tanzania, and Uganda— using panel data on workers for the period 2009 to 2013. We ask three basic questions. First, is there any evidence that an urban wage premium exists in Africa? Second, what role, if any, does spatial sorting play in explaining this wage premium? And third, which demographic groups benefit the most from agglomeration effects? Our findings present new evidence on the role of cities in Africa. Specifically, we find strong evidence that an urban wage premium exists and is not explained solely by the spatial sorting of more skilled workers into African cities. However, there is considerable heterogeneity in who benefits from agglomeration effects. We find evidence that the urban wage premium is largest for workers in the primate city of each country and, in some cases, non-existent for workers in secondary cities. In addition, the urban wage premium is only found to be significant for male workers in all three countries studied.

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1. Introduction

Africa is urbanizing fast. Currently, 4.72 million people live in African cities and this number is expected to double in the next twenty-five years (UN, 2015). By 2040 more than half of all Africans will be living in urban areas. How will this urbanization process affect the average African worker? If African cities increase worker productivity, average wages should rise as the urban share of the population increases.[1] There is ample evidence from the rest of the world that cities generate many benefits (called agglomeration economies) which raise productivity (see reviews by Rosenthal and Strange, 2004 and Combes and Gobillon, 2015).[2] Many of these benefits increase with scale: bigger cities generate larger productive advantages than smaller towns and rural areas. International evidence reveals that the elasticity of income with respect to city population is between 2% and 10% (Duranton, 2015).

How do cities do this? Several channels are highlighted in the urban economics literature (see Duranton and Puga, 2004 for a survey). First, cities facilitate the sharing of resources between workers and firms. Large markets in cities attract firms—including intermediate suppliers—which can reduce the price of a firm's inputs (resulting from tougher competition) and increase the range of inputs supplied. Shared labor markets make it easier for firms to hire new workers without having to spend a lot of time and money searching for the "right" applicant. In addition, cities facilitate the provision of certain goods or facilities (e.g., airports) which have to be supplied at large scale in order to be economically viable. And, finally, education is an important ingredient in generating knowledge spillovers because cities make it easier for workers to share information and learn from each other. Each of these mechanisms assumes that cities *make* workers and firms more productive. In other words, there is a causal relationship between increased economic density and increased productivity.

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[1] Urbanization can have a positive effect on rural wages as well. There may be backward linkages which increase the demand for agricultural products (Cali and Menon, 2009) and/or rural workers may end up with greater land per person.

[2] More recent studies include De la Rocha & Puga, 2015; D'Costa & Overman, 2014; Mion and Naticchioni, 2009; Combes, Duranton, and Gobillon, 2008; Di Addario and Patacchini, 2008; and Yankow, 2006.

While numerous studies have examined the size and sources of the urban wage premium in advanced countries, much less is known about productive benefits of cities in developing countries. To date, the limited evidence that we have comes from only a handful of studies which use worker data from Colombia (Duranton, 2016), India (Hnatkovska and Lahiri, 2014) and Brazil (Cruz and Naticchioni, 2012).[3] This is somewhat surprising, given that nearly all of the world's fastest growing cities—including many megacities—are located in the developing world. To partially fill this gap, we estimate the urban wage premium for three African countries: Nigeria, Tanzania, and Uganda. Similar to other studies, we find strong evidence that urban workers earn higher wages than equivalent workers in rural areas. Our estimates of the urban wage premium in Africa range from between 0.235 (log points) and 0.479 (log points), depending upon the country. These estimates are well within the range estimated for workers in more advanced economies, suggesting that African cities are generating similar agglomeration effects to cities elsewhere.[4]

But, is this the whole story? Much has been written about the different urbanization path taken by African countries (Gollin et al, 2015; Jedwab and Osei, 2013; Fay and Opal, 2000). Recent research suggests that African cities differ in four fundamental ways from cities in other developing regions. First, African countries are growing rapidly without a simultaneous increase in manufacturing activity (Figure 1). Second, African countries have a much smaller proportion of workers engaged in tradable production than cities elsewhere (World Bank, 2016). Third, African cities are expensive places to live. Urban households pay about 77% more for housing and 26% more for food than households in other cities at comparable levels of economic development (Nakamura, S, et al. 2016). And, finally, firms in

[3] There is an older, well-established literature which estimates the difference in per capita consumption and poverty rates between urban and rural areas. These studies find that urban areas have higher per capita consumption and a lower incidence of poverty than rural areas. Examples include Squire (1981) and WDR (2009).

[4] For example, Glaeser and Maré (2001) estimate an urban wage premium of between 0.071 (log points) and 0.441 (log points) for US workers.

African cities pay higher wages (at nominal exchange rates) than firms in other cities at comparable levels of economic development (Jones, 2016). See Figure 2.

The finding that output prices and wages are higher in African cities than elsewhere is a major concern for it raises the possibility that Africa's high urban wages may not reflect "true" productivity differentials. Instead, it is possible that inefficient firms in the non-tradable sector are able to pass on their higher urban costs to consumers in the form of increased prices. In addition, inefficient firms in the tradable sector—where prices are fixed by international markets—may be unable to compete globally. While we cannot address this question directly,[5] we can take a first step toward identifying whether there is any empirical evidence to support a causal relationship between African cities and higher worker productivity. We do this by first examining the importance of spatial sorting in determining the urban wage premium, and then identifying how agglomeration benefits are spread across both cities and workers.

Much has been written on the extent to which more productive workers self-select into cities based on unobserved factors. High ability workers may be attracted to cities because they have a greater preference for public amenities—like schools and cultural attractions—or because there is a greater demand for their skills by urban firms. To date, evidence on the existence of spatial sorting is mixed but some studies (Combes et al, 2008; Glaeser and Maré, 2001) suggest it plays a prominent role in explaining the observed urban wage premium in advanced economies. From a policy perspective, it is important to identify whether cities raise worker productivity (cities generate agglomeration effects) or simply attract more productive workers (cities result from spatial sorting). If agglomeration effects are important, understanding the different sources of these effects (e.g., sharing, matching, and learning) and their relative magnitudes is important. Likewise, if spatial sorting is important, understanding why high-skilled workers prefer to live in cities rather than rural areas is a

[5] To answer this question requires data on the physical output of workers. When using wages (or revenue-based measures of firm productivity) to measure agglomeration effects, it is impossible to determine whether higher wages (or establishment-level TFP) reflect higher physical productivity or simply higher prices.

key policy question. The answers to these questions lie at the very heart of why cities exist and their role in the development process.

In this study, we address these questions by presenting new evidence on the productivity-enhancing role of African cities. We proceed in several steps. First, we estimate the urban wage premium using standard OLS pooled regressions. This is an appropriate model as long as our specification includes all individual characteristics that affect both sorting and wages. If there are missing variables, the OLS estimates will be biased. Next, we consider estimating the urban wage premium using a fixed effects model. This model controls for all unobserved, individual worker characteristics that do not vary over time. A well-known weakness of this approach, however, is that identification is based solely on migrants who may not be representative of the average, urban worker. Unfortunately, this is the case for all three of our samples which, given the short time period covered by the panels, include only a small number of migrants. As a result, we are sceptical that the fixed effects results would generate unbiased estimates of the urban wage premium.[6]

Therefore, our next step is to re-estimate the wage equation using real wages (rather than nominal wages) as the dependent variable. As pointed out by Glaeser and Maré, (2001, p. 321): "if real wages are not higher in large cities, then ability levels are not higher in those cities as well." And, finally, we estimate the potential importance of unobservable skills in generating the urban wage premium using the same method proposed by Murphy and Topel (1990). Specifically, we presume that workers' unobservable skills have about the same effect on wage determination as workers' observable skills. We then estimate the impact of workers' observable skills and "net out" their effects from our wage estimates.

As a preview of our results, we find little evidence that spatial sorting plays a major role in determining the urban wage premium in Africa. This suggests that African cities are generating significant agglomeration effects (assuming that the estimated wage differentials reflect "true" productivity differentials). However, our results are not entirely optimistic.

[6] We did estimate the urban wage premium using a Fixed Effects Estimator but found inconsistent results compared to the other estimation techniques we used to identify the importance of sorting in explaining the wage premium. We are happy to provide these results on request.

Our data indicate that agglomeration benefits are not evenly spread across urban workers. In fact, once we control for the type of city where an individual works, we find no evidence of an urban wage premium outside of the primate city in either Nigeria or Tanzania. This suggests that secondary cities in both Nigeria and Tanzania are not generating significant agglomeration effects. Furthermore, we find that male workers employed in the primate city earn significantly higher wages than their rural counterparts but female workers do not. Finally, we find mixed evidence of a complementarity between skills and economic density across our three countries.

2. Why do we care about the Urban Wage Premium?

The urban wage premium provides one measure of the productive benefits of cities. When markets are competitive, average wages reflect the average marginal product of labor so higher urban wages (all else equal) indicate that workers employed in cities earn more than they would if they were employed in rural areas. Econometrically, problems arise with the "all else equal" condition. It is hard to control for all individual characteristics (e.g., quality of education, ambition) correlated with productivity. The econometric problems associated with estimating the "true" urban wage premium have led to two different hypotheses as to why a positive, urban wage gap is found in so many datasets.

The first assumes that cities generate productive advantages which raise the productivity of workers. That is, cities (because they have increased economic density) *cause* workers to be more productive:

Cities → Higher productivity.

International evidence provides strong support for this view: there is ample evidence that an urban wage premium exists in most cities in the developed world and that the size of this wage premium rises as cities get larger (see Duranton, 2008 for a review). For instance, workers who live in the 30 largest metropolitan areas in the United States earn 33% more than workers who live outside these areas (Glaeser and Maré, 2001). Similar estimates have been found for urban workers in other countries.

While few economists would dispute the claim that urban workers earn higher nominal wages than rural workers, there is less agreement on why such a wage premium exists. Some economists argue that cities do not raise productivity. Instead, they simply attract more productive workers who may have a greater preference for city amenities—like cultural attractions and universities—or who may be attracted to cities because there is greater demand for their skills. If this hypothesis is correct, the causality between productivity and city size is reversed. That is, cities grow because they attract more productive workers:

Higher productivity → Larger cities.

Identifying the "true" underlying relationship between city size and productivity is important for designing appropriate urban policies. If cities raise worker productivity, it is important to identify what mechanisms (e.g., industrial clustering, knowledge spillovers, access to public infrastructure) have the largest productivity enhancing effects. If cities simply attract more productive workers, it is important to identify why so many people wish to leave rural areas. However, distinguishing between the two hypotheses is not an easy task.

First, it is difficult for economists to control for all worker characteristics which may be correlated with productivity. Some characteristics—like ambition or innate ability—remain unobservable. Second, wage gaps are not identical to productivity gaps. Wages are only an indirect measure of worker productivity. While economic theory tells us that wages and productivity should be closely related, this relationship can break down in many settings like when labor and product markets are not perfectly competitive. Firms with market power may appear to have higher productivity than they actually do because they charge higher prices. Despite these caveats, the urban wage premium remains a useful measure of the productive advantage of cities. If an urban wage premium exists (even in nominal terms), it suggests that cities are generating some productive advantage to firms. Otherwise, firms (at least those in the tradable sector) would relocate to places where wages (and rents) were cheaper. The very fact that urban firms choose to remain in high-cost locations suggests that cities are productive places in which to operate a business.

3. Data and Estimation Strategy

Three panel data sets are employed to undertake a first estimation of the urban wage premium for African workers. We use the Nigeria National Household Survey (2010 and 2012), the Tanzania Panel Household Survey (2010-11 and 2012-13) and the Uganda National Panel Survey (2009, 2010, 2011, and 2012). Importantly, all three datasets include very precise geographic coordinates so it is possible to identify whether a worker lives in a large city, small city, or rural area.

To conduct our analysis, we first estimate the urban wage premium using a standard, pooled OLS regression:

$$w_{it} = \boldsymbol{x}'_{it}\beta + d_{it}\gamma + \lambda_t + \varepsilon_{it} \qquad (1)$$

where w_{it} is the wage of worker at time t, d_{it} is a dummy variable which take the value of one if the worker is employed in an urban area at time t, λ_t are time fixed effects, $\boldsymbol{x}'_{it}$ is a vector of worker and job characteristics, and ε_{it} is the error term. Equation (1) correctly identifies the urban wage premium only if we have data on all worker characteristics that affect both sorting and wages. If not, the urban wage premium will be biased. One method of addressing this problem is by including worker fixed effects in a panel specification (see Combes et al, 2008; and De la Rocha and Puga, 2012). That is, we could estimate the following fixed-effects (FE) regression:

$$w_{it} = \mu_i + \boldsymbol{x}'_{it}\beta + d_{it}\gamma + \lambda_t + \epsilon_{it} \qquad (2)$$

where μ_i is the worker fixed effect. A well-known weakness of this model, however, is that identification comes from migrants who may not be representative of the entire population.

De la Rocha and Puga (2014) argue that there is an additional source of worker heterogeneity that arises from the differential learning effects of cities. They argue that bigger cities generate larger learning effects than smaller cities. As a result, estimates of the urban wage premium will be biased if the wage equation does not include controls for workers' job histories (that is, how much time they have spent working in large versus small cities). Unfortunately, we cannot control for the job histories of workers in our sample.

However, our analysis suggests that few workers move from one sized city to another, at least during the period covered by our panel data.

4. Estimation Results

We begin our analysis by estimating equation (1) using nominal wages. We restrict our sample to adults (aged 16 to 65) who work full-time (20+ hours per week). Each regression controls for basic human capital variables—that is, age and its square, education, marital status, and gender—as well as a dummy variable for urban residence (*urban*), the logarithm of hours worked per week, and year fixed effects. The dependent variable is the logarithm of weekly earnings.

Several variations of this regression are estimated. To control for productivity differences among workers who are employed in different sectors and professions, we include industry and occupation fixed effects. In addition, we include a dummy variable indicating whether the worker is employed in the country's primate city—that is, Dar es Salaam[7] (for Tanzania), Kampala (for Uganda), and Lagos (for Nigeria). We include this control because we want to identify whether workers outside of the primate city are benefiting from economic density as well.

Let's examine the results for all workers (Table 1). In Tanzania, the estimated urban wage premium is 32%[8] when only human capital controls are included in the wage equation (column 1). This estimate falls by more than half to 15% when we introduce industry and occupation fixed effects, and include a control for Dar es Salaam (column 2). Notice that only the *Dar* dummy is significant in this specification, indicating that workers in secondary cities are not being paid higher nominal wages relative to their rural counterparts. By contrast, the estimated urban wage premium in Dar es Salaam is relatively large at 21%.

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[7] While Dar es Salaam is the primate city of Tanzania, it is not its political capital. In 1973 the government announced that it was moving the capital to Dodoma. However, the transfer of political administration has been incomplete. A large number of government departments remain in Dar es Salaam and, of course, it remains the business capital and largest city in the country.

[8] The percentage wage gap is calculated as e^{γ}-1.

We find somewhat larger effects for urban workers in Uganda. The estimated wage premium in Uganda is over 60% when we control for human capital alone (column 3) and remains at 50% when the full model is estimated (column 4). More importantly, the *urban* dummy remains significant, even after we include a control for Kampala, indicating that workers in secondary cities also earn a wage premium. We do not find this result for the other two countries. However, the size of the estimated wage premium in the primate city is nearly the same across all three samples: 20% for Lagos (column 6), 21% for Kampala (column 4), and 22% for Dar es Salaam (column 2). If these wage differentials represent "true" productivity differentials, our results suggest that agglomeration effects in Africa's primate cities are about the same size as those estimated for cities elsewhere.[9] For comparison, Table 2 lists the urban wage premia (relative to rural areas) which has been estimated for workers in other countries. These estimates range from 9% in the UK to 60% in France.

Our next step is to investigate the role of spatial sorting in explaining the observed urban wage premium. We use three two estimation strategies. First, we re-estimate equation (1) using real wages. As pointed out by Glaeser and Maré (2001), real wages should be significantly higher in cities when spatial sorting plays an important role in wage determination (Table 3). And finally, we employ the same approach as that used by Murphy and Topel (1990) and Glaeser and Maré (2001) for estimating the potential effects of unobservable skills on the estimated (nominal) wage premium.

We find no evidence of spatial sorting in either Tanzania or Uganda when we re-estimate the wage equations using real wages (Table 3).[10] While the urban wage premium is significant when we include only human capital controls, it loses significance once we introduce industry and occupation fixed effects. Unfortunately, we are unable to carry out this analysis for Nigeria due to a lack of price data. Corroborating evidence is also found when we "net out" the effects of workers' unobservable skills from the wage estimates. To derive these

[9] There is evidence from Africa that, on average, workers are paid the value of their marginal product. See Jones (2001). This study, however, covers only a few industries within the manufacturing sector in Ghana.

[10] Real wages are calculated as nominal wages deflated by the Fischer price index for food. To calculate the Fischer price indices, we used price data collected as part of the LSMS community surveys in both Tanzania and Uganda. We are grateful to the Uganda Bureau of Statistics (UBOS) for releasing the Uganda price data to us.

results, we presume that the importance of unobservable skills in explaining the wage differentials is similar to that of observable skills (Murphy and Topel, 1990; Glaeser and Maré, 2001). In all three countries, the gap in years of schooling between urban and rural workers is small: only 1.1 years for Nigeria; 1.5 years for Tanzania; and 1.2 years for Uganda. Furthermore, the estimated return to one year of education is 4.2 % for Nigeria, 7.4% for Tanzania, and 7.8% for Uganda. By combing these two statistics, we estimate that the (potential) impact of unobservable skills accounts for approximately 5% of the urban wage premium in Nigeria, 11% in Tanzania, and 9% in Uganda.[11] When we control for these effects, the estimated wage (nominal) premium is still relatively large: 11% for workers in Dar es Salaam, 13% for workers in Kampala, and 16% for workers in Lagos. Both sets of results indicate that spatial sorting is not playing a large role in determining the urban (nominal) wage premium in Africa. In other words, the results suggest that significant agglomeration effects are being generated in each country, at least in the primate city.

The next question is: Who benefits from these agglomeration effects? To address this question, we estimate equation (1) for different samples of workers. Specifically, we estimate separate wage equations by gender and education level. The results from these regressions are reported in Tables 4 and 5. We find strong evidence that the benefits of agglomeration are not being spread evenly across all workers. Instead, male workers employed in the primate city benefit disproportionately from urbanization (Table 4). That is, we find no evidence of an urban wage premium for female workers in any of the countries. Interestingly, we find mixed results with respect to a complementarity between skills and economic density. All forms of education are rewarded (in the form of higher wages) in Dar es Salaam but not in Tanzania's secondary cities. By contrast, only the less-educated earn a wage premium in Uganda while the data indicate that there is no complementarity between skills and economic density in Nigeria. These results stand in stark contrast to what is usually found in more advanced economies. There is a great deal of empirical evidence that the benefits of agglomeration increase with skill level (Glaser, 2011; Combes et al, 2012; de la

[11] Glaeser and Maré (2001, p. 330) find somewhat smaller size effects for workers' unobserved skills. In the US labor market, the dense metropolitan area wage effect is 5.2% smaller when they control for these variables.

Rocha and Puga, 2015). However, Duranton (2016) finds no evidence of a complementarity between city size and skills for workers in Colombia.

5. Conclusion

Well-managed cities can bring large benefits to firms and workers. In this paper, we examine the productive benefits of cities in Tanzania, Nigeria, and Uganda by investigating whether there is any evidence of an urban wage premium in each country. Our results indicate that most cities in Africa are not generating the same benefits to wage employees as cities in other countries. In both Tanzania and Nigeria, only workers in the primate city earn higher wages relative to their rural counterparts. By contrast, the data support the existence of an urban wage premium for all urban workers in Uganda.

From a policy point of view, it is important to identify whether these wage differentials reflect "true" productivity differentials. Economic theory predicts that workers are paid the value of their marginal product (p x MPL) when markets are perfectly competitive. It is possible that nominal wages in African cities are artificially high because inefficient firms pass on their higher costs to consumers in the form of increased prices. Indeed, recent research from the World Bank reveals that urban households in Africa pay about 77% more for housing and 26% more for food than urban households in other cities at comparable levels of economic development (Nakamura, S, et al. 2016). Higher urban costs may be one reason why African firms have not been more successful at breaking into global markets (Venables, 2016). While we cannot address this issue directly, we do investigate whether the urban wage premium is being driven by the spatial sorting of workers into cities—the first step toward identifying whether there is any causal relationship between increased economic density and increased worker productivity. The bulk of our empirical evidence indicates that spatial sorting does not play a large role in wage determination, suggesting that Africa's cities—at least its primate cities—are generating significant agglomeration effects.

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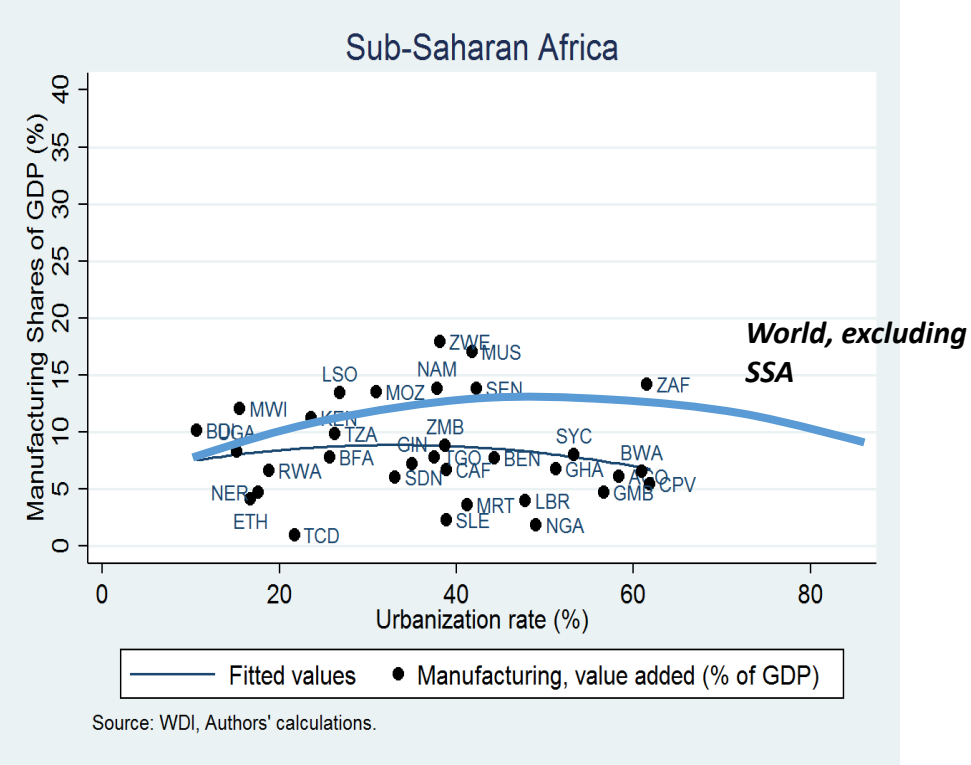

Figure 1: Urbanization and Economic Development
Source: Authors' calculations based World Bank Economic Surveys, 2015.

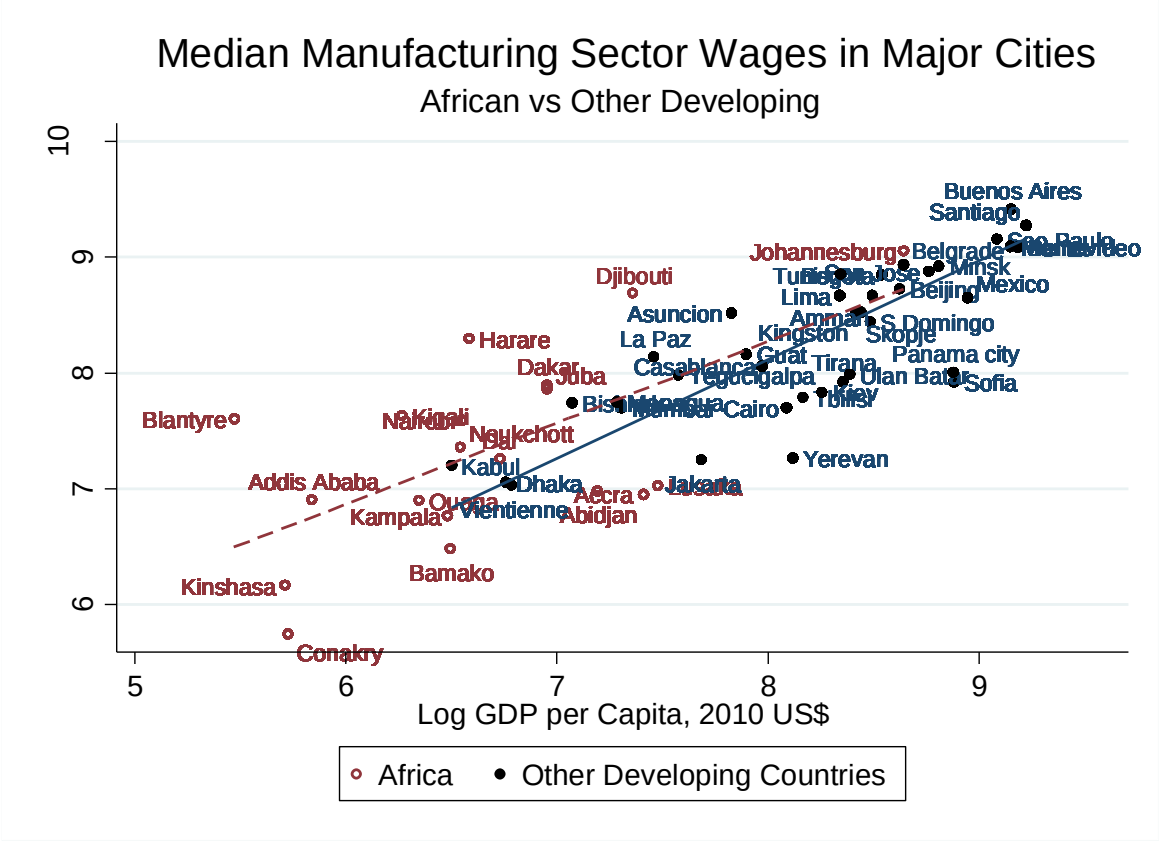

Figure 2: Nominal Wages in African Cities versus Other Cities
Source: Authors' calculations based World Bank Economic Surveys, 2015.

Table 1: OLS Estimates of the Urban Wage Premium

	Tanzania	Tanzania	Uganda	Uganda	Nigeria	Nigeria
	(1)	(2)	(3)	(4)	(5)	(6)
Urban	0.281**	0.144	0.479**	0.126*	0.184*	0.078
	(0.05)	(0.08)	(0.06)	(0.06)	(0.08)	(0.08)
Primate City	---	0.196**	---	0.188*	---	0.182*
		(0.06)		(0.06)		(0.09)
Primary	0.328**	0.153*	0.558**	0.175*	0.021	0.026
	(0.06)	(0.06)	(0.07)	(0.07)	(0.09)	(0.10)
Secondary	1.165**	0.613**	0.729**	0.124	0.394**	0.320**
	(0.07)	(0.09)	(0.204)	(0.20)	(0.11)	(0.11)
Higher	2.384**	1.637**	1.565**	0.604*	0.675**	0.391**
	(0.11)	(0.15)	(0.30)	(0.27)	(0.11)	(0.14)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry	No	Yes	No	Yes	No	Yes
Occupation	No	Yes	No	Yes	No	Yes
Worker	No	No	No	No	No	No
Observations	3,693	2,830	2,929	2,894	2,000	1,981
R-squared	0.358	0.421	0.214	0.376	0.131	0.24

Notes: Robust standard errors in parentheses. Standard errors are clustered by enumeration area. Dependent variable is log-weekly wages. All regressions control for gender, age and its square, marital status, and log(hours worked per week). Primate city corresponds to Dar es Salaam for Tanzania sample, Kampala for Uganda sample, and Lagos for Nigeria sample.

*** indicates significant at 1% level.

** indicates significance at 5% level.

Table 2: The Urban Wage Premium for Selected Countries & Years

Country	Year(s)	Rural-Urban Wage Gap %		Urban Comparison Group	Data	Author(s) & date
		Nominal	Real			
Spain	2004-2009	55%	---	Primate City: Madrid.	Continuous Sample of Employment Histories.	De la Rocha & Puga (2016)
UK	1988-2008	9%	---	Cities with > 100,000 workers in 1999.	Annual Survey of Hours & Earnings (ASHE) & New Earnings Survey (NES).	D'Costa & Overman (2014)
India	1983 1993-4 1999-2000 2004-05 2009-10		51% 39% 41% 30% 27%	Urban areas have: 1) a minimum population of 5000; 2) at least 75% of the male population working in non-agricultural activities; and 3) a density of population of at least 1000 people per square mile.	Employment & Unemployment Surveys of the National Sample Survey (NSS).	Hnatkovska & Lahiri (2014)
Brazil	2002, 2009	---	17% 15%	Ten Largest Metropolitan Areas	National Household Survey (PNAD) for Brazil.	Cruz & Naticchioni (2012)
France	1976-1996 (4-year Intervals)	60%	---	Primate City: Paris.	Annual Social Data Declarations database for France.	Combes, Duranton, & Gobillon (2008)
USA	1980s & 1990s	23%-32%	---	Metropolitan areas with population > 1 million.	Several used: 1990 Census, NLSY, CPS.	Glaeser & Maré (2001)

Source: Bernard, D'Aoust, and Jones (2015)

Table 3: OLS Estimates of the (Real) Urban Wage Premium

	Tanzania	Tanzania	Uganda	Uganda
	(1)	(2)	(3)	(4)
Urban	0.155***	0.088	0.236***	-0.062
	(0.05)	(0.07)	(0.06)	(0.06)
Primate City	---	0.093	---	0.044
		(0.06)		(0.07)
Year FE	Yes	Yes	Yes	Yes
Industry	No	No	No	No
Occupation	No	No	No	No
Worker	No	No	No	No
Observations	3,593	2,734	2,908	2,894
R-squared	0.328	0.40	0.16	0.33

Notes: Robust standard errors in parentheses. Dependent variable is log-weekly wages. All regressions control for log(hours worked per week). Primate city corresponds to Dar es Salaam for Tanzania sample, Kampala for Uganda sample, and Lagos for Nigeria sample. Number of observations are slightly lower than that for wage equations using nominal wages due to missing price data for some workers.

*** indicates significant at 1% level.

** indicates significance at 5% level.

Table 4: OLS Estimates of the Urban Wage Premium by Gender

	Tanzania Males (1)	Tanzania Females (2)	Uganda Males (3)	Uganda Females (4)	Nigeria Males (5)	Nigeria Females (6)
Urban	0.160	0.059	0.115	0.143	0.103	0.219
	(0.09)	(0.12)	(0.06)	(0.09)	(0.10)	(0.19)
Primate City	0.257**	0.104	0.208*	0.192	0.284*	-0.051
	(0.07)	(0.10)	(0.08)	(0.10)	(0.12)	(0.12)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Occupation	Yes	Yes	Yes	Yes	Yes	Yes
Worker	No	No	No	No	No	No
Observations	1,916	914	1,825	1,069	1,211	770
R-squared	0.401	0.460	0.348	0.345	0.248	0.297

Notes: Robust standard errors in parentheses. Standard errors are clustered by enumeration area. Dependent variable is log-weekly wages. All regressions control for gender, age and its square, marital status, and log(hours worked per week). Primate city corresponds to Dar es Salaam for Tanzania sample, Kampala for Uganda sample, and Lagos for Nigeria sample.

*** indicates significant at 1% level.

** indicates significance at 5% level.

Table 5: OLS Estimates of the Urban Wage Premium by Level of Education

	Tanzania More-Educated	Tanzania Less-Educated	Uganda More-Educated	Uganda Less-Educated	Nigeria More-Educated	Nigeria Less-Educated
	(1)	(2)	(3)	(4)	(5)	(6)
Urban	0.237	0.146	-0.160	0.144*	0.071	0.104
	(0.163)	(0.08)	(0.34)	(0.06)	(0.10)	(0.13)
Primate City	0.218*	0.184*	-0.357	0.223***	0.208	-0.082
	(0.10)	(0.07)	(0.45)	(0.07)	(0.17)	(0.14)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Occupation	Yes	Yes	Yes	Yes	Yes	Yes
Worker	No	No	No	No	No	No
Observations	695	2,135	82	2,812	952	1,029
R-squared	0.38	0.24	0.58	0.376	0.33	0.21

Notes: Robust standard errors in parentheses. Standard errors are clustered by enumeration area. Dependent variable is log-weekly wages. All regressions control for gender, age and its square, marital status, and log(hours worked per week). Primate city corresponds to Dar es Salaam for Tanzania sample, Kampala for Uganda sample, and Lagos for Nigeria sample.

*** indicates significant at 1% level.

** indicates significance at 5% level.