The Impact of Public Employment on Labor Market Performance:

Evidence from African Countries[[1]](#footnote-1)

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**ABSTRACT**

Using census data for Ghana, Mali, and Mozambique, we study the long-term impact of public sector employment on local labor markets. We find that the public sector crowds out private employment and induces skilled workers to queue for a public job, thus increasing their unemployment rate. In addition, a growing public sector fosters employment in the tradable and non-tradable sectors, remarkably for the unskilled, and the reallocation of unskilled workers away from agriculture.

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1. **Introduction**

Each time a new public sector job is generated in a given location, the rising demand for local goods and services can lead to the creation of further jobs. Nonetheless, changes in local wages and prices can produce general equilibrium effects that crowd out additional jobs and boost aggregate unemployment rates. Importantly, the linkages between public employment and local labor markets may differ along the skill composition of the workforce. Given the bloated size of public employment in several developing countries, it comes as surprise that researchers overlooked the topic.[[4]](#footnote-4) Using micro data on Ghana, Mali and Mozambique, this paper answers the central question of whether public employment crowds out private employment in Sub-Saharan Africa.

1. **Theoretical Considerations**

Following Roback (1982), Moretti (2011), and Faggio and Overman (2014), assume each city is a competitive economy employing labor to produce a nationally traded good, whose price is exogenously determined, a non-traded good, whose price is locally determined, and a public sector good. Wages in the tradable and non-tradable sectors are bargained locally, and public sector wages, higher than in the private sector, are bargained at national level. The public-private wage gap implies the existence of a job-rationing mechanism in the public sector: workers can either work in the private sector for a certain wage or enter a lottery for a public job and face the possibility of unemployment. A positive shock to local production in the public sector increases the number of public sector employees, but it also bears indirect effects on private employment and labor supply.

More public employment directly raises the demand for non-tradable goods. Due to rising job opportunities and wages in the area, increases in aggregate income foster the local demand for non-tradable services. Some non-tradable industries might be providers of goods and services that are substitutes for public sector provision, thus inducing a reduction in the demand for their services. Depending on the elasticity of local labor and housing supply, local wages, housing prices, and prices of non-tradables will increase. This rise in labor and housing costs is likely to induce a decline in the supply of local services, which might mitigate the increase in demand for local non-tradables.

In the tradable sector, instead, higher labor costs at the local level might hamper the competitiveness of enterprises and eventually employment. On the other hand, there might be a positive effect as the tradable segment may be a provider of intermediate goods for the public sector. Futhermore, the rising demand for non-tradables generates an increase in the demand for low-skilled workers who might abandon agriculture in order to take up jobs in the non-tradable sector. Finally, given that public wages are nationally bargained, the increase in local wages in the private sector reduces the wage gap. Thus, the unemployment rate should reduce to re-establish the equilibrium between expected wages in the public and private sector. Yet, the impact will depend on net immigration into the city and on the impact on labor force participation. Overall, the effects of public employment on local labor markets are theoretically ambiguous, and econometric techniques are required to empirically estimate the relationship.

1. **Empirical Strategy**

The analysis exploits data from the International Census Public Use Microdata Sample (IPUMS), which provides census information for Ghana (1984, 2000, 2010), Mali (1987, 1998, 2009), and Mozambique (1997, 2007).[[5]](#footnote-5) We define as public sector workers those working in public administration, education, health and social services; private employment is differentiated between workers in agriculture, tradable sector (mining, manufacturing, wholesale and retail trade), and non-tradable sector (the remaining activities). We also distinguish between skilled and unskilled workforce, the latter comprehending individuals with up to primary education.

Information on current labor market status and industry are collapsed at the smallest available administrative unit. Specifically, we obtain $P\_{d}^{S}$, which represents the total public sector employment of workforce endowed with skill $S$ in location $d$, and $Y\_{d}^{S}$, which refers respectively to private sector (tradable, non-tradable, and agriculture) employment and unemployment. For each of the main variables of interest we then calculate the change between time $t$ and $t-τ$ as a proportion of total private sector employment at time $t-τ$ for every location, and plug it in the following specification:

$\left(\frac{Y\_{d,t}^{S}-Y\_{d,t-τ}^{S}}{E\_{d,t-τ}}\right)=α+β\left(\frac{P\_{d,t}^{S}-P\_{d,t-τ}^{S}}{E\_{d,t-τ}}\right)+γX\_{d,t}+θ\_{a}+φ\_{t}+π\_{at}+ε\_{d,t}$ (1)

where controls $X\_{d,t}$ includes initial population size and population change divided by private sector employment at time $t-τ$; $θ\_{a}$ ($φ\_{t}$) denotes location-specific (time) fixed effects; and $π\_{at}$ are location-specific linear time trends.

As the relationship may be confounded by increases in public sector employment that also have a positive effect on public employment (e.g. shocks may be mitigated *via* expansion of public hiring), we adopt an instrumental variable strategy. Inspired by the shift-share approach suggested by Card (2001), we construct our exclusion restriction by assigning to each location a predicted share of public employment, based on its initial share multiplied by the national growth in public sector employment (excluding $d$). Our first stage equation can hence be expressed as:

$\left(\frac{P\_{d,t}^{S}-P\_{d,t-τ}^{S}}{E\_{d,t-τ}}\right)=δ+ρ\left(\frac{P\_{d,t-τ}}{E\_{d,t-τ}}×\left(\frac{P\_{C, t}^{-d}-P\_{C, t-τ}^{-d}}{P\_{C,t-τ}^{-d}}\right)\right)+σX\_{d,t}+θ\_{a}+φ\_{t}+π\_{at}+μ\_{d,t}$ (2)

1. **Results**

Table 1 reports OLS (columns 1-3-5) and 2SLS (columns 2-4-6) estimates of equation (1) for the whole sample of workers separately by country.[[6]](#footnote-6) Overall, public sector crowds out private employment and the estimated elasticity ranges between 2.1% in the case of Ghana and 3.3% in the case of Mozambique. It induces an increase in unemployment in Mali, with a statistically significant elasticity of about 0.4%. Rows 2 to 4 in Table 1 show that the sign of the elasticity differs by sector and the overall negative impact is largely ascribable to shifts out of agriculture that cannot be fully absorbed by the tradable and non-tradable sectors. Tradable and non-tradable sectors employment increases with a point estimates of around 2% for the first (in the case of Mali and Mozambique) and between 1.5% and 4.2% for the latter. Agricultural employment is reduced substantially and the effect is statistically significant in all the countries.

Table 2 shows heterogeneous effects by skill level. Public sector employment has a multiplier effect on tradable and non-tradable employment for both skilled and unskilled workers and on unemployment for the skilled. However, the overall effect is negative and large for unskilled workers due to the loss of agricultural jobs.[[7]](#footnote-7)

The estimated elasticities can be converted into a measure of the local employment multiplier by multiplying $β$ by the relative size of the private to the public sector. As in the initial census there were 16 (35) private sector jobs for each public job in Ghana (Mozambique), our estimates imply that for each additional public job around 32 (118) jobs were lost in the Ghanaian (Mozambican) private sector. A loss of about 67 agricultural jobs in Ghana and over 200 in Mozambique is accompanied by a modest job creation in the non-tradable sector (7 jobs in both countries) and 3 in the tradable sector in Mozambique only.

Our findings are robust to several checks. Firstly, for each country we exclude the area of the capital, since it typically has the largest share of public employment. Secondly, when possible, we restrict the sample to the most recent spell and modify our instrument by using a longer lag to avoid serially correlated shocks. Thirdly, we control for earlier private employment trends in order to rule out the effect of omitted variables.[[8]](#footnote-8)

1. **Conclusion**

Our results highlight multiple impacts of public employment on local labor markets. We find that, while favoring queues for a public job among the skilled, public employment fosters structural transformation away from agriculture, and it generates jobs in both the tradable and non-tradable sectors, with a larger effect for unskilled workers.

**References**

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Table 1. Public employment and local labor markets (whole sample)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Ghana 1984/2000/2010** | **Mali 1987/1998/2009** | **Mozambique 1997/2007** |
|  | OLS | 2SLS | OLS | 2SLS | OLS | 2SLS |
|   | (1) | (2) | (3) | (4) | (5) | (6) |
|  | ***PANEL A - Second stage*** |
|  |  |  |  |  |  |  |
| Private Employment | -1.516\*\*\* | -2.104\*\* | -1.009 | -0.441 | -2.635\*\* | -3.342\*\* |
|  | (0.497) | (0.986) | (0.723) | (0.788) | (1.112) | (1.358) |
| Tradable | 0.479 | 0.799 | 1.074\* | 2.105\*\* | 2.031\*\*\* | 1.947\*\*\* |
|  | (0.447) | (1.041) | (0.598) | (0.805) | (0.635) | (0.668) |
| Non-Tradable | 1.889\*\*\* | 4.179\*\*\* | 1.236\*\*\* | 2.398\*\*\* | 1.207\*\*\* | 1.543\*\*\* |
|  | (0.316) | (1.130) | (0.280) | (0.553) | (0.166) | (0.383) |
| Agriculture | -3.884\*\*\* | -7.082\*\*\* | -2.821\*\* | -3.901\*\*\* | -5.873\*\*\* | -6.831\*\*\* |
|  | (1.043) | (2.461) | (1.142) | (1.264) | (0.809) | (1.427) |
| Unemployment | 0.263 | -0.100 | 0.236\*\*\* | 0.441\*\*\* | 0.091 | 0.041 |
|  | (0.213) | (0.381) | (0.059) | (0.102) | (0.065) | (0.084) |
|  |   |   |   |   |   |  |
|  | ***PANEL B - First stage*** |
|  |  |  |  |  |  |  |
| Public Employment |  | 0.526\*\* |  | 0.319\*\*\* |  | 0.786\*\*\* |
|  |  | (0.218) |  | (0.057) |  | (0.186) |
|  |   |   |   |   |   |   |
| F-Stat |   | 16.65 |   | 35.32 |   | 18.01 |
| N | 208 | 208 | 94 | 94 | 143 | 143 |

Notes. (I) \*\*\*, \*\*, and \* represents 1%, 5%, and 10% significance levels. (II) Standard errors (in parenthesis) are clustered at the lowest administrative unit level (robust standard errors for Mozambique). (III) Specifications include area fixed effects, initial total employment level (log), population change, and, whenever possible, time dummies and area-specific linear time trends.

Table 2. Public employment and local labor markets (by skill level)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Ghana 1984/2000/2010** | **Mali 1987/1998/2009** | **Mozambique 1997/2007** |
|  | 2SLS | 2SLS | 2SLS | 2SLS | 2SLS | 2SLS |
|  | Skilled | Unskilled | Skilled | Unskilled | Skilled | Unskilled |
|  | (1) | (2) | (3) | (4) | (5) | (6) |
|  | ***PANEL A - Second stage*** |
|  |  |  |  |  |  |  |
| Private Employment | 2.814\*\*\* | -4.918\*\*\* | 0.292\*\*\* | -0.733 | 0.623\*\*\* | -3.965\*\*\* |
|  | (0.721) | (1.178) | (0.101) | (0.761) | (0.192) | (1.436) |
| Tradable | 1.318\*\*\* | -0.519 | 0.160\*\*\* | 1.945\*\* | 0.220\*\*\* | 1.727\*\* |
|  | (0.353) | (1.003) | (0.048) | (0.769) | (0.057) | (0.689) |
| Non-Tradable | 1.808\*\*\* | 2.372\*\*\* | 0.198\*\* | 2.200\*\*\* | 0.388\*\*\* | 1.155\*\*\* |
|  | (0.440) | (0.781) | (0.084) | (0.474) | (0.140) | (0.396) |
| Unemployment | 0.571\*\*\* | -0.671 | 0.172\*\*\* | 0.269\*\*\* | 0.055\*\*\* | -0.014 |
|  | (0.117) | (0.408) | (0.058) | (0.058) | (0.011) | (0.089) |
|  |   |   |   |   |   |   |
|  | ***PANEL B - First stage*** |
|  |  |  |  |  |  |  |
| Public Employment | 0.526\*\* | 0.526\*\* | 0.319\*\*\* | 0.319\*\*\* | 0.786\*\*\* | 0.786\*\*\* |
|  | (0.218) | (0.218) | (0.057) | (0.057) | (0.186) | (0.186) |
|  |   |   |   |   |   |   |
| F-Stat | 16.65 | 16.65 | 35.32 | 35.32 | 18.01 | 18.01 |
| N | 208 | 208 | 94 | 94 | 143 | 143 |

Notes. (I) \*\*\*, \*\*, and \* represents 1%, 5%, and 10% significance levels. (II) Standard errors (in parenthesis) are clustered at the lowest administrative unit level (robust standard errors for Mozambique). (III) Specifications include area fixed effects, initial total employment level (log), population change, and, whenever possible, time dummies and area-specific linear time trends.

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4. Even cross-country studies such as Algan et al. (2002) do not take into consideration developing countries. [↑](#footnote-ref-4)
5. For 17 out of the 20 countries in Sub-Saharan Africa available in the IPUMS database it was impossible to perform the present analysis, due to a lack of a sufficient number of years, administrative units comparable over time and/or industrial classification. [↑](#footnote-ref-5)
6. The first-stage F statistic is above 10 and the impact of our instrumental variable is statistically significant and positive. [↑](#footnote-ref-6)
7. As agricultural workers are mostly unskilled, we do not distinguish the effect by skill level, and we refer to Table 1 for the overall results. [↑](#footnote-ref-7)
8. Results available upon request. [↑](#footnote-ref-8)