High-Speed Data Access and Employment in Africa

Saaketh Vummalaneni(1); Ben Anderson, MSc(2); Alan O'Connor, MBA(2)
(1)UNC-Chapel Hill, Chapel Hill, NC; (2)RTI International, Research Triangle Park, NC

Introduction

Africa is a hotbed of economic growth. However, in 2017, only 18 percent of households in Africa had broadband Internet access (ITU, 2017). This is an issue because many people and modern businesses depend on the Internet, so Africa is trailing behind the rest of the world in this regard. To mitigate this issue, high-speed data technology has been introduced in recent years.

Objective

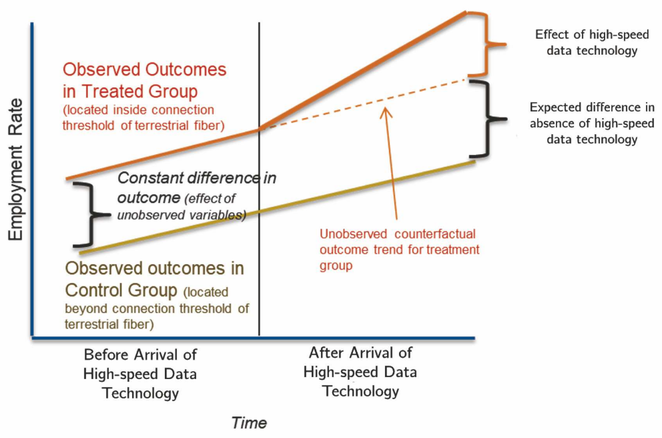
Determine whether there is a causal link between the arrival of the high-speed data technology and employment in six specified countries: Nigeria, Democratic Republic of the Congo (DRC), Kenya, Tanzania, Mozambique, and South Africa.

Methods

Using microdata from Afrobarometer and the Demographic and Health Surveys (DHS), we conducted a difference-in-differences analysis (DD).

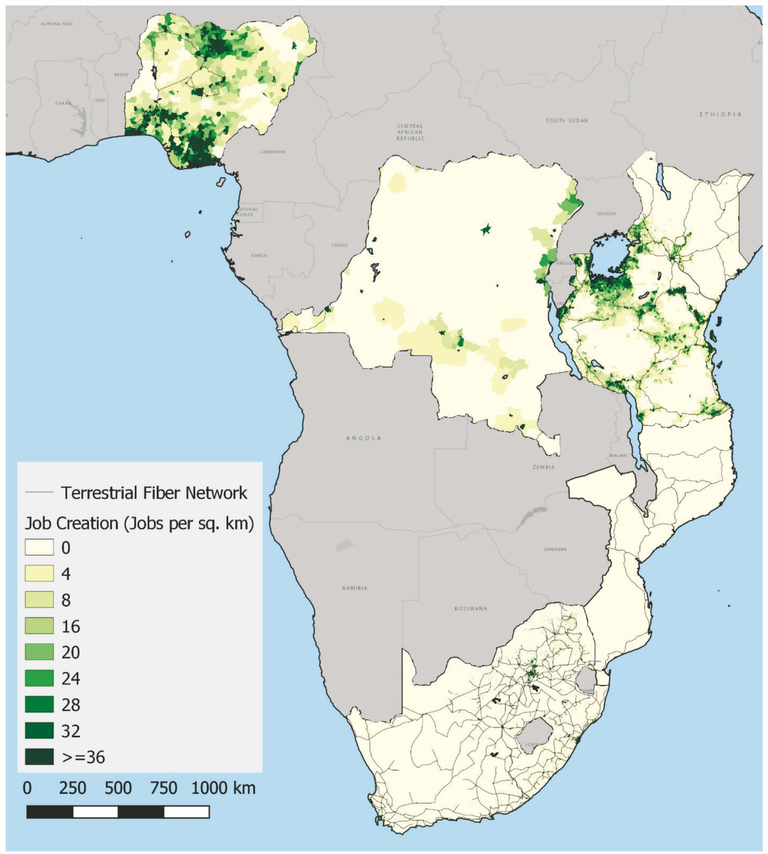
- DD estimation identifies a specific intervention or treatment—in this case, introduction of a high-speed data technology—and then compares the difference in outcomes for the treatment and control groups before and after the intervention.
- Assignment to the treatment was achieved using geocoded data on individuals' locations and fiber networks.
- In practice, observations within a few hundred meters to the closest point on the fiber network (at baseline) were assigned to the treatment group because they were exposed to the arrival of high-speed data.
- The remaining observations within a 10 km radius of the fiber network were assigned to the control group.

Figure 1. Difference-in-Differences Analysis



Visualization

Figure 2. Potential Job Creation in Africa



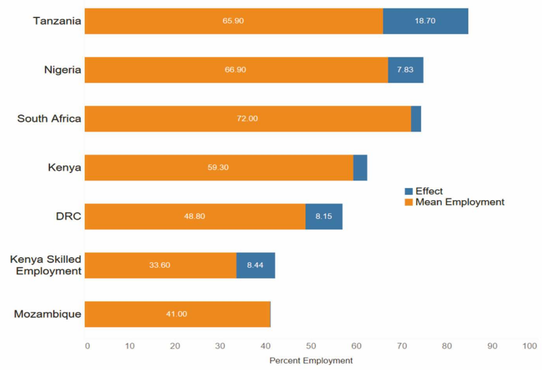
Note: The right tail of data was truncated to show greater detail.

For each country, we estimated the causal effect on the treated group then applied the estimates to the population of each country to produce a map in QGIS reflecting potential job-creation density if access to internet were to be expanded.

Results

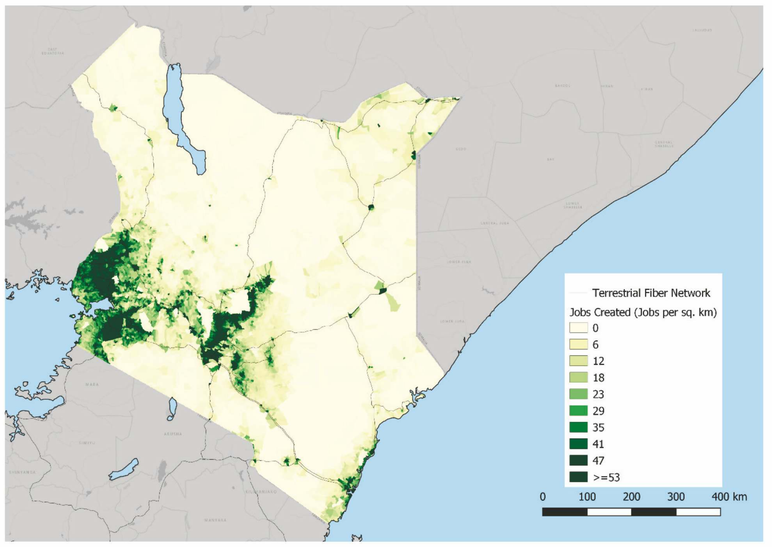
- The estimated effect was positive for every country studied except Mozambique.
- The effects were statistically significant for Nigeria, DRC, and Tanzania.
- The estimates reflect the causal effect of the high-speed data technology on one's probability of being employed if located in a connected area.

Figure 3. Increase in Employment Caused by High-Speed Data Technology in Connected Areas



Specific Analysis

Figure 4. Skilled Employment in Kenya



Note: The right tail of data was truncated to show greater detail.

In countries with DHS data, we were able to group people by occupation and analyze the effect of the high-speed data technology on skilled and nonskilled occupations. In Kenya we did not see a statistically significant increase in overall employment among the treated. Instead, we found highly significant effects that showed an increase in skilled employment and a decrease in nonskilled employment.

Conclusion

Based on our results, building high-speed data infrastructure in Africa may be one of the most effective policy options to create jobs.

References

1. ICT Facts and Figures 2017. (n.d.). Retrieved July 25, 2019, from https://www.itu.int/en/ITU-D/Statistics/Pages/facts/default.aspx
2. Figure 1. Picture Adapted from Columbia University Mailman School of Public Health. Difference-in-difference estimation. https://www.mailman.columbia.edu/research/population-health-methods/difference-difference-estimation
3. Figure 2 and Figure 4. Raster Data Source: Center for International Earth Science Information Network - CIESIN - Columbia University. 2018. Gridded Population of the World, Version 4 (GPWv4): Population Density, Revision 11. Palisades, NY: NASA Socioeconomic Data and Applications Center (SEDAC). https://doi.org/10.7927/H49C6VHW. Accessed July 7, 2019.

Presenting Author: Saaketh Vummalaneni
School: UNC-Chapel Hill
E-mail: internships@rti.org
RTI International: 3040 E. Cornwallis Road
Research Triangle Park, NC 27709

Presented at: 11th Annual RTI Internship Showcase
August 12, 2019 | 1:00 pm–4:00 pm
Horizon Building
William M. Moore Jr. Collaboration Center