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INITIATIVE ON National Policies and Strategies

IFPRI Discussion Paper 02160

December 2022

The Role of Spatial Inequalities on Youth Migration Decisions

Empirical Evidence from Nigeria

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Abstract

We combine nationally representative data from Nigeria with spatiotemporal data from remote sensing and other sources to study how young migrants respond to observable characteristics of potential destinations, both in absolute terms and relative to origin locations. Migrants prefer destinations with better welfare, land availability and intensity of economic activity. We also find that migrants prefer shorter distances and those destinations with better urban amenities and infrastructure. However, responses vary by type of migrant and migration. For example, rural-rural migrants are more responsive to land availability and agricultural potential, while rural-urban and urban-urban migrants are more responsive to welfare and economic vibrancy (measured by nightlight intensity) in destinations. Distance induces varying impact on migration choices of poor and non-poor migrants as well as across more educated and less educated migrants. Longer distances discourage migration for female migrants, poorer migrants and less educated migrant while the implication for the non-poor and more educated migrants appears to be negligible. This is intuitive because poorer and less educated migrants have liquidity constraints to finance high migration costs. Our results suggest potential scope for predicting how labor mobility responds to alternative regional development policies.

Keywords: Migration, types of migration, youth migration, destination choice, Nigeria.
JEL: O15, R23; P25

Acknowledgments

This work is part of the CGIAR Research Initiative on National Policies and Strategies (NPS). CGIAR launched NPS with national and international partners to build policy coherence, respond to crises, and integrate policy tools at national and subnational levels in six countries in Africa, Asia, and Latin America. We would like to thank all funders who supported this research through their contributions to the CGIAR Trust Fund: *https://www.cgiar.org/funders/*

1. Introduction

The spatial flow of labor within countries both responds and contributes to the geographical distribution of economic activity and opportunity, and as such, is part and parcel of the development process. Understanding how migration decisions – e.g., whether to leave or not, where to go, and how long to go for –can help to inform our understanding of the potential outcomes of alternative regional development strategies. Both the incentives and costs associated with alternative migration decisions are likely to vary across different types of migration flows – rural-rural, rural-urban, temporary, and permanent migration – as well as across migrant characteristics. Several studies associate outmigration decisions to weather and climate-related conditions (e.g., Barrios, Bertinelli, & Stroble, 2006; Dillon, Mueller, & Salau, 2011; Gray & Mueller, 2012; Cattaneo and Peri, 2016; Mueller, Sheriff, Dou, & Gray, 2020). Other studies relate outmigration decisions with access to land and related tenure security (e.g., de Brauw & Mueller, 2012; Kosec, Ghebru, Holtemeyer, Mueller, & Schmidt, 2018). Migration involves substantial travel and transaction costs and hence several studies highlight the impacts of these costs on migration decisions and types (e.g., McKenzie & Rapoport, 2007; Abramitzky, Boustan, & Eriksson, 2013; Hirvonen, 2016; Morten & Oliveira, 2016; Ingelaere, Christiaensen, De Weerdt, & Kanbur, 2018; Chen, Kosec, & Mueller, 2019; Lagakos, Marshall, Mobarak, Vernot, & Waugh, 2020; De Weerdt et al., 2019).

However, most existing studies attempt to explain the first stage of migration decision, i.e., whether to migrate or not, rather than the secondary stage of where to migrate and for how long. Migration destination and duration are both important for defining the overall net benefits and impacts of migration, as well as our ability to predict such flows. For instance, while the productivity differences between rural and urban areas of Africa suggest that further rural-urban migration may narrow the rural-urban productivity gap and hence improve welfare of migrants (McKenzie, Gibson, & Stillman, 2010, Beegle, De Weerdt, & Dercon, 2011; Bryan, Chowdhury, & Mobarak, 2014), this may not be equally the case for all types of migration flows or the different types of individuals who self-select into such alternative flows. For example, there are longstanding concerns that rural-urban migration to some already densely populated areas may lead to increased unemployment, affect provision of public services, and potentially contribute to political unrest (Harris & Todaro, 1970; de Brauw, Mueller, & Lee, 2014; Lambert, Ravillion, & van de Walle, 2014; Kosec et al., 2018). This is particularly the case in areas where urbanization

has not been accompanied by industrialization and proportionate demand for labor – a situation which characterizes much of Africa's urbanization (e.g., Gollin, Jedwab, & Vollrath, 2016; Abay & Amare, 2018; Abay, Tiberti, Woldemichael, Mezgebo, & Endale, 2022). However, our ability to design policies that help maximize the gains and minimize the negative consequences of migration requires a better understanding of how migrants of different characteristics respond to spatial differences in amenities, resources, and economic activity.

In this paper we take a destination perspective to understanding potential pull factors for various forms of migration: rural-rural, rural-urban, and urban-urban, as well as temporary versus permanent migration. There are few studies on modeling migrant destination choices (e.g., Yu, Zhang, & Wu, 2020; Fafchamps & Shilpi, 2013; Lucas, 2015a, 2015b; De Weerdt et al., 2020; Amare, Abay, Arndt, & Shiferaw, 2021).[1] This paper extends these studies in several dimensions. First, unlike these studies we examine how the attributes of potential destinations, both in absolute terms as well as relative to origins of migration, affect migration outcomes. We hypothesize that observable attributes of potential destinations, both in absolute terms as well as relative to origin of migration, affect youth migration patterns, while also exploring potential heterogeneities in these effects across type of migrant and migration flow. Second, our focus on youth provides a new perspective to understanding and explaining persistent flow of youth out of agriculture in several African countries. Our focus on youth– defined as individuals aged 15-34 – is motivated by the relatively higher mobility and higher unemployment rates of youth in many parts of Africa, including Nigeria, which has made youth migration the object of considerable policy attention. For instance, disparities in urban intensity, agricultural potential, rainfall patterns, planting seasons and land availability could influence migration patterns. Third, we aim to identify differential impacts of these destination attributes on alternative type of migration: rural-rural vs rural-urban migration. For instance, differences in urban intensity levels (as proxied by nighttime light intensity recorded in satellite data) between origin and potential destination of migration is likely to trigger rural-urban migration while corresponding differences in agricultural productivity and land availability can be expected to induce rural-rural migration. Identifying and understanding such pulling factors can inform migration policies, including on required optimal shifts in labor force composition needed to improve the welfare of migrants (Yu et al., 2020; Kaestner & Malamud, 2014; Lagakos

[1] For example, Amare et al. (2021) investigate whether urban growth and associated spatial and temporal differences in urban growth can attract youth migration.

et al., 2020). We also differentiate migration patterns, including between temporary versus permanent migration patterns. The pull factors for temporary and permanent migration are likely to vary across attributes of destinations. For instance, temporary migration may be driven by seasonal labor demand in more productive or labor scarce areas, and hence plays important roles in addressing seasonal labor constraints in surplus producing regions and allows efficient use of surplus labor across various areas (Bryan et al., 2014; Dustmann & Gorlach, 2016; Chen et al., 2019). On the other hand, permanent migration involves slightly longer decision-making processes, higher costs and barriers. Overall, this study aims to make a direct contribution to understanding pull factors of youth migration in Nigeria, an interesting case where youth migration remains a major challenge of national and regional policy makers. The growing population of Nigeria has resulted in a distressing increase in the youth population, thereby resulting in a significantly larger working age population.

Our analysis makes several contributions to the empirical literature on internal migration in Africa. First, as noted above, while the conceptualization of migration has long emphasized both push and pull factors, there has been relatively limited empirical evidence to date on the latter. While most our results are intuitive, and in many ways unsurprising, they do contribute to a stronger and more nuanced empirical understanding of how spatial differences in amenities, opportunities and other spatial characteristics drive reallocation of labor in Nigeria. Secondly, our implementation of a dyadic comparison of destinations and origins underscores the analytical importance of *relative* distributions of endowments, beyond their absolute values. Third, our explicit focus on young migrants directly engages some of the on-going policy issues surrounding under-employed, and potentially politically volatile youth in rural and urban areas. While we do not provide definitive policy responses to these issues, we do contribute a firmer empirical basis for understanding how they play out across spatially heterogenous regional development landscapes.

We find that migrants' choice of destination is negatively affected by cost of living and distance to potential destinations while positively affected by welfare, land availability and urban intensity in potential destination states. However, the response of migrants to observable characteristics of potential destinations varies across migration patterns (e.g., rural-rural versus rural-urban) duration of migration (temporary versus permanent) and socioeconomic status (e.g., poor versus non-poor). For instance, rural-rural migrants are more responsive to land availability

and agricultural potential while rural-urban youth migrants are more responsive to welfare and urban intensity in potential destinations. Longer distance significantly deters migration of poorer migrants and less educated migrant while the implication for the non-poor and more educated migrants appears to be negligible. These findings have important implications and hence can inform domain-specific migration policies in Africa.

The remaining sections of this paper are organized as follows. Section 2 provides a brief review of the relevant migration literature, Section 3 describes the data, and Section 4 presents our empirical strategy. In Section 5 we present our empirical results and discussions. Section 6 provides concluding remarks.

2. Review of Migration Theories and Literature

The canonical Harris and Todaro (1970) model posit that migration represents a response to perceived wage differentials between two locations. This is an intuitive driver of mobility because wealth and economic activities are unequally distributed across counties, districts, states and regions (Young, 2014; Clemens, 2011; Gollin et al., 2016). Based on this model, as urban wages are usually higher than rural wages, we observe significant rural-urban migration in many developing countries. This is partly reflected in significant differences in labor productivity in the urban (non-agricultural) and rural (primarily agricultural) sectors (Lewis, 1954; Young, 2014; Clemens, Özden, & Rapoport, 2015).

However, observed spatial wage differentials only imperfectly explain migration patterns observed in many parts of the world. For instance, the current rural-urban productivity gap between rural and urban areas of Africa would suggest greater levels of rural-urban migration than are actually observed (McKenzie et al., 2010; Beegle et al., 2011; Bryan et al., 2014; Howell, 2017). Furthermore, while migration to large urban areas is expected to generate the largest welfare gains, most rural-urban migration in Africa takes place to secondary towns where the expected returns to any particular migration decision are smaller (Christiaensen, De Weerdt, & Kanbur, 2019; De Weerdt et al., 2020).[2] This implies that prospective migrants either face important constraints and frictions to move to the most remunerative destinations, or they are incorporating other factors into their destination decisions, such as risk and uncertainty, existing social networks and knowledge,

[2] Although the aggregate welfare impacts of such moves can be larger than those accruing to aggregate moves to large urban centers, because of the differing magnitudes of such flows (Christiaensen et al., 2019).

or destination amenities and opportunities which are difficult to explicitly quantify (Dustmann & Okatenko, 2014; Clemens et al., 2015). Migrants usually face heterogenous migration costs that affect returns to migration (Lagakos et al., 2020).

Even without constraints to movement, idiosyncratic factors may dampen the wage differential signal. Harris and Todaro (1970) allow for deviations between a migrant's subjective perception of a wage differential and the actual differential. They also conceptualize the decision to be sensitive to subjective assumptions about unemployment probabilities and subjective discount rates. Recent empirical work supports the notion that individuals' risk aversion and subjective assessments of uncertain outcomes do affect migration decisions (e.g., Clemens, 2011; De Weerdt et al., 2020).

More integrative migration models conceptualize migration as a strategy that households adopt to maximize expected earnings, and lower consumption risk, by diversifying their income sources over various sectors or agroecological zones (Mincer, 1978; Lucas & Stark, 1985), or as a way of overcoming various types of constraints (e.g., missing credit or insurance markets). For instance, households may migrate from rural to urban areas to address credit market constraints (Rozelle, Taylor, & de Brauw, 1999). Households may also migrate in response to production shocks and hence as a risk coping strategy (e.g., Dillon et al., 2011; Clemens, 2011).

However, much of the empirical migration literature has focused on explaining why people migrate, rather than where they migrate to and how they choose these destinations. Several studies have empirically identified several push factors and constraints: weather and climate-related conditions (e.g., Barrios et al., 2006; Dillon et al., 2011; Gray & Mueller, 2012; Cattaneo & Peri, 2016) and/or quality of productive resources in origin locations (de Brauw & Mueller, 2012; Lewin, Fisher, & Weber, 2012; Dorosh & Thurlow, 2014 ; Abramitzky et al., 2013; Lambert et al., 2014; Kosec et al., 2018); and travel and transaction costs implied by movement (e.g., McKenzie & Rapoport, 2007; Abramitzky et al., 2013; Hirvonen, 2016; Morten & Oliveira, 2016; Ingelaere et al., 2018; Chen et al., 2019; De Weerdt et al., 2020).

There is a largely qualitative literature that has developed around migrant aspirations which includes descriptive work around destination decision making (e.g., Kleist & Thorsten, 2016). Key findings from this literature are that while expected financial returns to migration is a key consideration, other factors, such as risk and perceptions about other destination attributes, are also important and major constraints. This work tends to emphasize path dependency of decisions

(which are often informed by prior experiences within social networks) as well as strongly gendered patterns that differ by contexts. Because much of this work has focused on rural-urban and international migration decisions, it has arguably not systematically addressed the most salient set of migration options available to rural Africans, including rural-rural movements, which constitute the bulk of migration in the region. Furthermore, little of this work is quantitatively explicit, and of arguable generalizability.

There are relatively few quantitatively oriented studies of migration which explicitly focus on destination decisions (Fafchamps & Shilpi, 2013; Lucas, 2015a, 2015b; De Weerdt et al., 2020; Yu et al., 2020; Amare et al., 2021). In a study of internal migration decisions in Nepal, Fafchamps and Shilpi (2013) find that some measures of accessibility and infrastructural endowments (but not others) were positive correlates of destination outcomes. Lall, Timmins, and Yuer (2009), using a broader set of destination community amenities, find that urban amenities were positively associated with the likelihood of in-migration in Brazil. Yu et al. (2020), using eigenfunction-based spatial filtering (ESF) approach, find that places with better accessibility by roads, better economic opportunities, and cooler average annual temperature strongly influence migration patterns. In Africa, there are few studies which have explicitly focused on understanding migration destination decisions. Recent work by De Weerdt et al. (2020), in Tanzania, show that geographical distance between migrant origin and potential destinations is an important factor: migrants are more likely to move to areas which are closer and have lower costs of migration and less uncertainty about outcomes (Hirvonen, 2016; Henry, Boyle, & Lambin, 2003). However, De Weerdt et al. (2020) also note that, over time, internal migration may follow a stepping-stone pattern, in which initial moves to relatively accessible nearby locations enable subsequent moves to more distant urban destinations.

A number of recent papers have also started to document the patterns of rural-rural migration in Africa, some of which shed light on destination choices. More favorable agricultural production environments were also found to be important characteristics of rural migration destinations in Malawi (Lewin et al., 2012). Labor market opportunities may also be important drivers. Wineman and Jayne's (2016) study of rural migration patterns in Tanzania finds higher-density areas being particularly important destinations, with welfare returns to migration generally coming from wage-employment outcomes. Chamberlin et al. (2020) find descriptive evidence that rural in-migration rates in Zambia are highest in relatively high-access areas with relatively greater

wage income opportunities (as well as other measures of agricultural and non-agricultural economic vibrancy).

However, these pieces of evidence have largely been generated in the pursuit of other primary research questions. The few studies that explicitly focus on modeling destination choice have focused on a particular attribute. No study to date has offered a comprehensive evaluation of destination attributes as attractors for migration flows within an African country setting. In this paper, we undertake such an analysis, using nationally representative data for Nigeria, a country with one of the largest populations of youth in Africa that is characterized by relatively high rates of internal migration and spatial inequality (Benson et al., 2017). Ours is among the few studies that employ a dyadic comparison of origin and destination characteristics to better understand the nature of youth migration flows and their drivers.[3] Given the increasing importance of migration within the on-going transformation of African economies (Jayne, Chamberlin, & Benfica, 2018) such insights are of broad general relevance.

3. Data and Variable Measurement

3.1. Data sources

This paper uses three waves of panel data coming from the Living Standards Measurement Study—Integrated Surveys on Agriculture (LSMS-ISA) for Nigeria. These three waves of data were collected in 2010/2011, 2012/2013, and 2015/2016. The LSMS–ISA data are nationally representative and include detailed information on demographic and socioeconomic characteristics of households, including information on household members' migration, education, labor allocation and health. Our sample includes both rural (68% of the sample) and urban (32% of the sampled) households. These data integrate a comprehensive set of tracking questions on occupation and locations of migrant household members which enables analysis of migration decisions and destinations. These surveys collect information on the destination state of migrants, which allows us to distinguish different types of migration. The LSMS-ISA data also provide geo-referenced household locations, which enables merging these longitudinal data with spatiotemporal data from remote sensing, including nightlight intensity and long-term rainfall

[3] Similarly, De Weerdt et al. (2020) employ a similar approach for understanding the implication of distance to potential destinations. As noted elsewhere in this paper, Fafchamps & Shilpi (2013) take a similar approach to analyzing migration destination choices in Nepal.

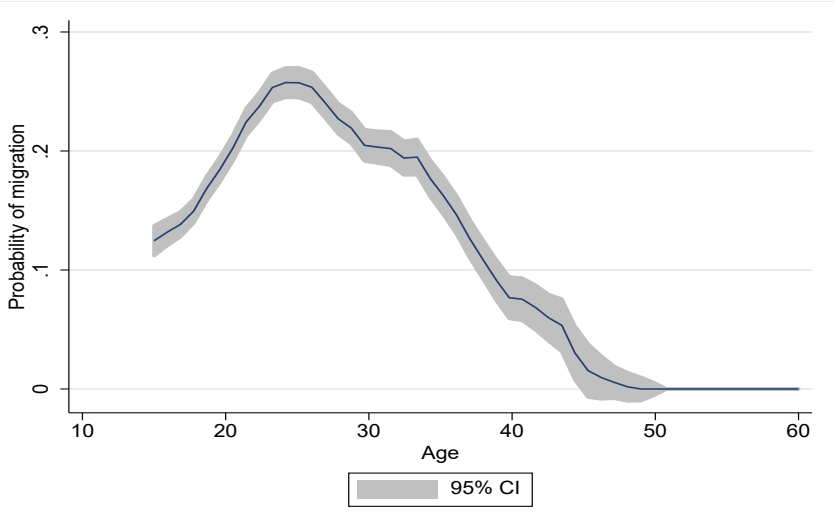
spells. This facilitates investigation of the implication of spatial destination attributes in shaping migration patterns.

3.2. Variable measurement

Outcome variables

Our focus in this paper is on internal migration, within which we focus on migration decisions by youth, defined as individuals 15 to 34 years of age, following the African Union's Youth Charter (UN, 2014).[4] Our focus on youth is motivated by the fact that the youth exhibit relatively higher mobility and hence are probably more sensitive to attributes of potential destination states. Figure 1 shows that the relationship between migration probability and age of individuals. The graph clearly shows that migration probabilities start to increase at age 15 and continues to sharply increase until age 25, after which migration probabilities continuously decline. The graph indicates the higher rates of mobility by young people in Nigeria – with more than three-fourths of all migrants in Nigeria being between 15 and 34 -- although it also highlights that most young people are not moving immediately upon reaching school-leaving age, but rather some years after attaining legal majority.

Figure 1: Probability of out-migration by age of individual



[4]We adopt this commonly used definition in part to facilitate comparison with other studies of youth. We acknowledge, however, that any discrete age-based classification criterion is arbitrarily defined and may not always map cleanly onto societal definitions of youth or functional attributes of young people (Ripoll et al., 2017).

To enrich our analysis, we define three different migration indicators. First, we consider a broad definition of migration that involves any type of mobility for any reason and destination. We define migrants as those individuals who are present in round t but are either non-resident in round $t+1$ and/or have been absent for at least one month during the previous 12 months before round $t+1$ is conducted. It excludes household exits due to death and those who moved within the same village. Second, we classify migration as rural-rural, rural-urban, urban-urban and urban-rural based on origin and destination classifications.[5] Third, we differentiate migration patterns into temporary and permanent migration based on the duration of migration, with temporary migration defined as absences of at least one month but less then twelve months, and permanent migration defined as absences of 12 or more months. These migration typologies could provide differing insights for policy as the drivers and constraints facing different migration patterns as well as nature (and characteristics) of migrants differ (Chen et al., 2019). Although these migration patterns may be simultaneously decided together with the destination decisions, modelling such joint outcomes become analytically difficult and computationally involving. For this purpose, we assume that the type of migration pattern, for example, whether to migrate to rural or urban areas or whether to migrate permanently or temporarily is decided before the choice of destination.

Key explanatory variables

To better understand the attributes of migrant origin and destination locations we compute average state level spatial attributes, including average nighttime light intensity and long-term precipitation (extracted from geospatial databases on the basis of household coordinates).[6] We also generate state-level averages of household per capita consumption, agricultural productivity, and land availability, as proxied by farm size. As we are interested in both absolute and relative attributes to migration destinations, we also compute pre-existing (i.e., prior to migration) average

[5] For example, rural-urban migrants are those individuals who were present in round *t* in rural areas but reported to have moved to an urban area in round *t+1*. We use the rural/urban classification of the enumeration areas in the LSMS-ISA dataset, as defined by the National Bureau of Statistics in Nigeria. Criteria used for such classification generally include population size, population density, type of economic activity, physical characteristics and level of infrastructure.

[6]The Operational Linescan System (OLS) sensors of the Defense Meteorological Satellite Program (DMSP) of the United States Airforce are the source of these data. Night light intensity data measured at a resolution of approximately 1 km^2 from all over the planet are captured on a daily basis by these satellite-based remote sensors and are then processed by the National Oceanic and Atmospheric Administration (NOAA). Long-term rainfall data are extracted from the daily Africa Rainfall Climatology Version 2 (ARC2) of the National Oceanic and Atmospheric Administration's Climate Prediction Center (NOAA-CPC) (Novella and Thiaw, 2013); the ARC2 data are available at a spatial resolution of approximately 11 km^2.

differences in economic opportunities and living conditions, agricultural productivity, availability of land, urbanization, living expenses, market access and rainfall patterns between potential migrant destination and the point of origin. This mimics the earliest economic migration models which are built on the hypothesis that the migration decision involves comparing expected wage differentials between two spatial units. Relative attributes between these two locations can capture wage differentials or other differences in infrastructural and social services that may attract migrants (see description of variables in appendix Table A1). To gauge the implication of transportation and related transaction costs, we also construct an indicator of distance between origin and potential destination. However, as our unit of analysis remains at state level, we simply construct distance between capital city of origin and destination, which is not exactly what migrants actually face but a good proxy for the distance and transportation costs migrants usually faces if they decide to move to different states. For simplicity, we refer this indicator as distance to potential destination.

We compute these absolute and relative attributes of migrant destinations for the period before migration takes place for two reasons: (a) intuitively, individuals can only know those absolute and relative spatial differences in economic opportunities and base their migration decisions accordingly before they migrate; (b) by doing so, we can address potential reverse causality issues and control for factors that may influence both expected key variables of interest and migration decisions. Hence, we characterize individuals' migration patterns in time $t+1$ against the absolute and relative spatial differences in key variables of interest between potential migrant destination and origin of migration in the previous period t.

3.3. Descriptive results

Table 1 presents summary statistics of migration patterns observed in our sample, as well as individual and household characteristics. Using our broadest definition of migration (involving any type of mobility for any reason and destination), we identify 3,140 migrants between 2010-2015, with movements to all 37 states. 20% of the youth in our sample migrated at some point over the three survey rounds. Of these, 13% were rural-rural migrants, 54% were rural-urban migrants, 29% were urban-urban and 4% were urban-rural migrants. 65% of these migrants were temporary migrants and the remaining were permanent migrants, per our definition. This may indicate that temporary migrations are important for meeting seasonal labor demands and could

contribute to consumption smoothing for the migrant families, as commonly documented in other developing country settings (Bryan et al., 2014; Dustmann & Gorlach, 2016; Chen et al., 2019).

Table 1: Descriptive summary statistics for outcome and explanatory variables

Variables	Pooled		2012-13		2015-16	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Migration types						
Migrant, 0/1	0.17		0.10		0.24	
Rural-rural, 0/1	0.13		0.07		0.15	
Rural-urban, 0/1	0.54		0.61		0.51	
Urban-urban, 0/1	0.29		0.29		0.30	
Temporary migrant, 0/1	0.65		0.51		0.71	
Permanent migrant, 0/1	0.35		0.49		0.29	
Individual & household characteristics (baseline data)						
Gender –Female, 0/1	0.49	0.50	0.49	0.50	0.49	0.50
Age, years	23.05	9.10	22.01	8.75	24.15	9.34
Schooling, years	9.41	5.55	9.31	5.28	9.51	5.81
Married	0.24	0.43	0.24	0.43	0.24	0.43
Household size, number	6.91	3.16	6.54	3.25	7.29	3.02
Consumption ($ppp) per adult equivalent (AEU)	1130.29	1026.80	1120.51	1006.48	1140.55	1047.67
Cost of living (Consumer price index)	135.32	3.98	134.29	3.75	135.34	4.11
Agricultural productivity ($ppp real crop income per hectare)	4592.50	9324.38	4518.22	8830.28	4668.62	9805.04
Land per adult equivalent (AEU), Ha	0.19	1.12	0.18	1.05	0.20	1.19
Nighttime light, DN	6.06	12.06	5.15	10.82	7.02	13.16
Long term mean rainfall (mm)	1375.24	591.59	1382.08	588.96	1368.11	594.28
Distance between origin and destination capital cities (Km)	441.29	229.66	434.27	232.29	449.57	226.30
Number of observations	17,475		8,921		8,554	

Source: Authors' calculations based on Nigeria LSMS-ISA 2010-11, 2012/13 and 2015/16 rounds and other geospatial data sources, including the national geophysical data center (NGDC) of the United States' National Oceanic and Atmospheric Administration (NOAA). Migration is reported for a given round based on movement recorded from the prior round.

We follow Fafchamps and Shilpi (2013) to create a dyadic dataset that contains 3,140 migrants and 37 potential state destinations.[7] We assume that migrants consider all 37 states as potential destinations. This implies that each migrant has chosen to move to one destination; and has therefore chosen not to move to the 36 other potential destinations. Based on the dyadic dataset that links all migrants to all destinations, we first report the descriptive results on the difference between actual and alternative migration destinations. We then examine which of these differences are explaining migration patterns in Section 5.

[7] Nigeria has 36 states and one federal territory (the Federal Capital Territory). For simplicity, we refer to these as 37 states.

Table 2: Descriptive summary statistics for outcome and explanatory variables

	Non-Migrant	Migrant	Difference
Gender –Female, 0/1	0.5	0.47	0.02**
Age, years	22.8	24.35	-1.56***
Schooling, years	9.03	11.31	-2.28***
Married	0.25	0.22	0.02***
Household size, number	6.95	6.71	0.24***
Consumption ($ppp) per adult equivalent (AEU)	680.66	963.72	-283.06***
Cost of living (Consumer price index)	135.29	134.34	0.95
Agricultural productivity ($ppp real crop income per hectare)	4,515.86	4,986.71	-470.85**
Land per adult equivalent (AEU), Ha	0.18	0.23	-0.05**
Nighttime light, DN	5.76	7.61	-1.85***
Long term mean rainfall	1,329.86	1,605.41	-275.54***
Distance between origin and destination capital cities (Km)	496.31	432.31	64**
Number of observations	14,597	2,878	

Source: Authors' calculations based on Nigeria LSMS-ISA 2010-11, 2012/13 and 2015/16 rounds and other geospatial data sources, including the national geophysical data center (NGDC) of the United States' National Oceanic and Atmospheric Administration (NOAA).

Table 2 provides the distribution of covariates across migrant and non-migrant youth. As migration decisions are endogenous outcomes, this table shows significant observable differences between migrants and non-migrants. Male youth are more likely to migrate than female. The average age of migrants is about 24 years. Migrants tend to have higher and better formal education. Married youth are less likely to migrate than those who never married. The most likely to migrate appear to be those with greater probability of success in urban zones, as indicated by education level, and more ties to rural zones, as indicated by land productivity. In accordance with this view, several studies have identified potential constraints and barriers to migration, including transportation and search costs (Hirvonen, 2016; Morten & Oliveira, 2016; Lagakos et al., 2020).

Table 3: Comparing observable characteristics of youth at the actual destination to alternative destinations

	Actual destination	Alternative destination	Dif. (actual vs altern.)
Consumption per AEU	1188.23	1085.81	102.42***
Living expense	135.18	135.28	-0.10
Agricultural productivity	4838.40	4703.86	134.54***
Land per AEU	0.17	0.19	-0.02***
Nighttime light	12.10	8.93	3.17***
Long-term mean rainfall	1618.20	1404.33	213.87***
Distance to destination (km)	467.01	493.56	26.55**

Source: Authors' calculations based on Nigeria LSMS-ISA 2010-11, 2012/13 and 2015/16 rounds and other geospatial data sources, including the national geophysical data center (NGDC) of the United States' National Oceanic and Atmospheric Administration (NOAA).

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3 reports average value of key variables of interest at actual destination state and alternative potential destinations states. When we compare the key variables between actual destination and alternative destinations, we find that migrants generally tend to move to states where consumption, urban intensity, agricultural productivity, and rainfall patterns are unconditionally higher. Migrants tend to move to states with higher urban intensity and market access, partly driven by the fact that rural-urban migration remains the most dominant type of migration in our sample. This is consistent with the presumption that urban intensity and the associated growth in economic opportunities and income prospects may attract youth migration (Fafchamps & Shilpi, 2013; Christiaensen et al., 2019, De Weerdt et al., 2020; Amare et al., 2021). Overall, the results in Table 3 show strong and significant differences between actual and alternative migration destinations. However, the implication of such differences is likely to vary across migration patterns and types. For instance, rural-urban migrants are more likely to be attracted by urban intensity in potential destination states while rural-rural migrants may focus on agricultural productivity, land availability and agricultural potential of destinations. We examine the implication of these differences, for overall choice of destination as well as across alternative types of migration, using an appropriate econometric estimation in the next section.

4. Empirical Strategy

We have 3,140 youth migrants who migrated in between the three rounds of the Nigerian LSMS-ISA survey. Given that we have migrants to each Nigerian state we assume that that each migrant can migrate to any of the 37 different state destinations. However, each of the migrants has chosen to move to one potential destination; and has therefore chosen not to move to the 36 remaining destinations. We are interested in explaining why each individual migrated to each actual destination and not to the remaining 36 states. We particularly aim to examine the effect of absolute and relative differences between origin of migration, actual and potential destinations.

Our dependent variable is destination choice of migrants (M_{iod}). M_{iod} is dummy equal to one if individual (i) migrates from state o to state d, and 0 otherwise. Youth migrants are defined as those individuals that were present in round 1(2) but either non-resident in round 2(3) and/or has been absent for at least one month during the previous 12 months before round 2(3) survey was conducted.

In our first-stage analysis and in the interest of examining the implications of observable attributes of destination attributes we compute (state level) average values of important spatial attributes such as urban intensity, rainfall patterns, land availability and living expenses. We then specify the following fixed effects linear probability model:

$$M_{iodt+1} = \beta_1 D_{idt} + \beta_1 X_{iodt} + \alpha_i + \varepsilon_{iodt+1} \quad (1)$$

where M_{iodt+1} is dummy equal to one if individual (i) migrates from state o to state d, and 0 otherwise. D_{idt} stands for observable attributes of potential destination states, including level of urbanization[8], agricultural productivity, rainfall spells, land availability, and living conditions. We presume that these attributes of potential destinations are attracting youth migrants and they may have differential implications on different types of migration patterns. X_{iodt} stands for individuals characteristics of migrants and their origin of migration. In most of our specifications we also control for individual fixed effects, as captured by α_i, in which case we cannot quantify the implication of individual characteristics (X_{iodt}). ε_{iodt+1} is an idiosyncratic error term, capturing other unobserved factors that may affect youth migration patterns.

Our second-stage analysis examines the implication of differences in attributes between origin and potential destination of migrants. Besides the absolute observable attributes of potential destination states, the differences in attributes across origin and potential destination state could play an important role in migration patterns and decisions. For instance, De Weerdt et al. (2020) show that distance between origin and potential destination of migration plays an important role in defining the spatial distribution of migration. The implication of such differences between origin and potential destination of migration are likely to vary across various types of migration. For instance, differences in agricultural productivity, land availability between origin and potential destination can affect rural-rural migration while such differences may be irrelevant for urban-urban migration. To investigate the implication of differences in observable attributes of origin and potential destination of migration we compute spatial difference in key observable attributes,

[8] We employ spatial differences in urban intensity as proxied by night light intensity between migrants' destinations and their origins of migration. Night light intensity data have several advantages in measuring the dynamics of urbanization and related human activities (Elvidge, Baugh, Kihn, Kroehl, E.R. Davis, & Davis, 1997; Henderson, Yeh, Gong, Elvidge, & Baugh, 2003; Amare, Arndt, Abay, & Benson, 2020; Abay & Amare, 2018). They are argued to be valid markers (proxies) for urbanization, especially compared to census-based rural-urban binary indicators. Spatial differences in night light intensity between these two locations can capture wage differentials or other differences in infrastructural and social services.

including urbanization, welfare, land availability, cost of living and rainfall patterns. We compute these differences for the period immediately before migration takes place. We then estimate the following empirical specification:

$$M_{iodt+1} = \beta_1(D-O)_{idt} + \beta_1 X_{iodt} + \alpha_i + \varepsilon_{iodt+1} \quad (2)$$

where $(D-O)_{idt}$ now stands for differences in (average) spatial attributes between potential destination and origin of migration. Remaining notations are as described in equation (1).

As we are controlling for individual level fixed effects in most of our estimations, the specification in equation (1)-(2) exploits relative differences in observable attributes between potential destination and origin states. We theoretically hypothesize that migrants evaluate potential destinations in view of their motives as well as potential differences between their current and potential destinations before making outmigration decisions. For instance, these spatial differences in key variables of interest may correspond to wage or labor productivity differences in these two locations.

In our dyadic data setting, each individual in the sample is a migrant and appears in each potential destination state, which induces interdependence across observations associated with each migrant. The interdependence across observations could generate correlations between the error terms associated with each migrant. Moreover, individuals living in the same village are expected to be exposed to similar shocks, implying correlation in unobserved effects across individuals in the same village. We follow previous studies (e.g., Fafchamps & Shilpi, 2013) and cluster standard errors at local government area (LGA) of origin to account for this interdependence and possible correlation in the choice of destination by all migrants originating from the same LGA.

Similarly, large-scale migration trends and outcomes may shape key characteristics of interest, introducing potential reverse causality problems (Dahl, 2002; Borjas, 2006). To address these challenges, we compute average values of states and their differences between the origin and potential migrant destination before migration has taken place. In other words, we use existing values of differences in key variables interest, those corresponding to pre-migration periods, which ensure that key variables of interest are not affected by subsequent youth migration patterns. In this setting, we can reasonably assume that the difference in key explanatory variables between in their origin and potential destination can be exogenous to short-term migration decisions and outcomes.

5. Results

Our main results are summarized in Tables 4 through 6. We first present evidence on the implication of potential destination characteristics in attracting youth migration. These are considered as the pull factors of migration. We further uncover potential varying impacts of these destination attributes in attracting alternative forms of migration: rural-rural, rural-urban and urban-urban migration. We then analyze the implication of differences in important observable attributes between potential destination and origin of migration. Results for the variables included in all specifications are much in line with our expectations. To facilitate interpretation, we assume that the type of migration (e.g., rural-urban vs rural-rural) and choice of destination are made sequentially with the former being made regardless of the latter. This may be implausible for some patterns of migration, but assuming otherwise entails joint modelling of type of migration and destination choice which is analytically difficult.

5.1. Destination characteristics and youth migration

Table 4 provides results associated with equation (1), which characterizes the implication of potential destination characteristics in attracting youth migrants. The first column reports fixed effects results associated with any type of migration while the remaining columns report estimation results for different types of migration. The first column results show that destination characteristics plays significant role on destination choice of migrants. The results indicate that higher consumption levels and urban intensity in the destination states attract youth migrants, while expensive living costs (as captured by consumer price index) discourages youth migrants. Similarly, favorable rainfall patterns attract youth migrants. This is consistent with previous evidence highlighting availability of employment opportunities (in agriculture and non-agriculture), and the availability of agricultural land for youth at their current locations can attenuate to motivations to migrate (McKenzie & Rapoport, 2007; Kosec et al., 2018), and that unavailability of these productive resources can encourage migration (Dorosh & Thurlow, 2014 ; Abramitzky et al., 2013; Lambert et al., 2014; Kosec et al., 2018). These are intuitive generalizations, although their implications may vary across different types of migration patterns. Thus, we model the influence of these factors separately across rural-rural, rural-urban, and urban-urban migration flows. We also examine the varying implications of destination characteristics on

temporary and permanent migration decisions. The remaining five columns of Table 4 highlight these differences across alternative migration flows.

Table 4: Destination choice of migrants by destination characteristics

	(1)	(2)	(3)	(4)	(5)	(6)
Destination characteristics	Any type of migration	Rural-rural	Rural-urban	Urban-urban	Temporary	Permanent
Ln (Average consumption)	0.012***	-0.053***	0.017***	0.032***	0.008**	0.019***
	(0.003)	(0.008)	(0.004)	(0.005)	(0.003)	(0.004)
Ln(Consumer price index)	-0.055***	0.607***	-0.197***	-0.113***	-0.018	-0.105***
	(0.020)	(0.058)	(0.029)	(0.038)	(0.027)	(0.033)
Ln(Agricultural productivity)	0.000	0.019***	-0.004***	-0.002	0.001	-0.002
	(0.001)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
Ln(Average farm size)	-0.008**	0.071***	-0.027***	-0.006	-0.007	-0.010
	(0.004)	(0.011)	(0.006)	(0.007)	(0.005)	(0.006)
Ln(Average nighttime light)	0.004***	-0.021***	0.003**	0.018***	0.003**	0.006***
	(0.001)	(0.003)	(0.001)	(0.002)	(0.001)	(0.002)
Ln(Average long-term annual rainfall)	0.017***	0.090***	0.009***	0.001	0.014***	0.027***
	(0.002)	(0.006)	(0.003)	(0.004)	(0.003)	(0.003)
Ln(Distance to destination)	-0.390**	-0.175	-0.401*	-0.847***	-0.437**	-0.395
	(0.165)	(0.479)	(0.238)	(0.314)	(0.220)	(0.276)
Ln(Distance to destination) square	-0.031**	-0.010	-0.033*	-0.067***	-0.035**	-0.031
	(0.013)	(0.038)	(0.019)	(0.025)	(0.018)	(0.022)
Constant	-1.148**	-4.065***	-0.367	-2.332**	-1.416**	-1.047
	(0.529)	(1.537)	(0.764)	(1.007)	(0.707)	(0.888)
Individual fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	116439	13432	55951	31836	65479	41145

Source: Authors' calculations based on Nigeria LSMS-ISA 2010-11, 2012/13 and 2015/16 rounds and other geospatial data sources, including the national geophysical data center (NGDC) of the United States' National Oceanic and Atmospheric Administration (NOAA).

Note: Standard errors, clustered at LGA level, are given in parentheses with * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4 shows that in most types of migration flow, individuals are more likely to move to those destinations with higher welfare (as measured by average consumption). On the other hand, higher living costs (as measured by consumer price index) discourages immigration. The effect of welfare as well as cost of living remains similar in most types of migration, implying that these all types of migrants consider these factors when making destination choices. This implies that improved welfare and economic opportunities, as well as lower cost of living in migrant destinations, are important factors in attracting youth migration.

Longer distance between origin and potential destination states discourages migration. The coefficient associated with distance between state capitals assumes negative values for almost all types of migration. This is intuitive and strongly highlighted by De Weerdt et al. (2020). Longer distances involve higher transportation and transaction costs, and these costs can be prohibitive for poor migrants. The relationship between distance and migration decisions exhibits some

nonlinearity although the second order coefficient appears to be small to generate curvature or reversal of sign in the relationship.

Interestingly, the remaining spatial attributes in Table 4 have differential and sometimes contrasting implications across the different types of migration patterns. For instance, land abundance at destination states encourages rural-rural while its implication on other types of migration patterns remains insignificant or discouraging immigration. Similarly, higher agricultural productivity and long-term average rainfall, attracts rural-rural immigration while the impact of agricultural potential remains negligible or of smaller in size for other types of immigration. This is intuitive because rural-rural migrants (who are often seasonal migrants) may prefer destinations with better availability of farm activities and agricultural wage employment, even if consumption levels are lower on average. On the other hand, urban intensity in the destination attracts rural-urban and urban-urban migration, while discouraging rural-rural immigration, consistent with previous evidence highlighting urbanization as an attractor for migration (Naudé, 2010; Lucas 2015b; Amare et al., 2021). A higher cost of living discourages permanent immigration, while cost of living remains negligible for temporary immigration.

Table 5: Destination choice of migrants by poverty, gender and education status.

	(1)	(2)	(3)	(4)	(5)	(6)
Destination characteristics	Poor	Non-poor	Female	Male	More educated	Less educated
Ln(Average consumption)	-0.018***	0.030***	0.008**	0.016***	0.021***	-0.011**
	(0.004)	(0.003)	(0.004)	(0.004)	(0.003)	(0.005)
Ln(Consumer price index)	0.045	-0.109***	-0.035	-0.067**	-0.107***	0.079**
	(0.034)	(0.027)	(0.029)	(0.031)	(0.023)	(0.038)
Ln(Agricultural productivity)	-0.001	0.000	-0.002	0.003	-0.000	0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)
Ln(Average farm size)	0.013*	-0.022***	-0.006	-0.012**	-0.012***	0.004
	(0.007)	(0.005)	(0.006)	(0.006)	(0.005)	(0.007)
Ln(Average nighttime light)	-0.000	0.006***	0.003**	0.004***	0.006***	-0.001
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Ln(Average long-term annual rainfall)	0.017***	0.021***	0.018***	0.021***	0.037***	-0.034***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.004)
Ln(Distance to destination)	-0.677**	-0.305	-0.529**	-0.357	0.564***	-2.879***
	(0.280)	(0.221)	(0.238)	(0.254)	(0.193)	(0.312)
Ln(Distance to destination) square	-0.055**	-0.023	-0.042**	-0.028	0.047***	-0.234***
	(0.022)	(0.018)	(0.019)	(0.020)	(0.015)	(0.025)
Constant	-2.269**	-0.797	-1.624**	-1.068	1.829***	-8.915***
	0.045	-0.109***	-0.035	-0.067**	-0.107***	0.079**
Individual fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	40496	64283	55931	48848	84175	32264

Source: Authors' calculations based on Nigeria LSMS-ISA 2010-11, 2012/13 and 2015/16 rounds and other geospatial data sources, including the national geophysical data center (NGDC) of the United States' National Oceanic and Atmospheric Administration (NOAA).

Note: Standard errors, clustered at LGA level, are given in parentheses with * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Results by poverty status of youth are represented in (column – 1 and 2): poor household are those households with per capita consumption below the poverty line ($1.90 in 2010 $ PPP), while non-poor migrant households are those whose per capita consumption level is above $1.90 in 2010 $ PPP. Educated migrants are those individuals with educational attainment level above the median years of schooling for youth in our sample (10 years), while less educated youth are those whose educational attainment level is below the median years of schooling**.** We have compared regression coefficients across groups using suest test. The results showed that most of the coefficients are statistically different across groups.

Table 5 shows that different destination attributes on migration decisions by young people with differing individual and household-level characteristics: poverty status, gender, level of education, and age. Poor young migrants are more likely to migrate to potential destinations characterized with greater land availability. Both young female and male migrants are more likely to migrate to destinations characterized by higher welfare and urbanization levels. There are stark differences between the factors affecting migration decisions of more and less educated migrants. More educated youths are relatively more likely to migrate to destinations characterized by higher welfare and higher urban growth and agricultural potential. Distance between origin and destination states appears to have varying implications. As expected, longer distances discourage migration for poorer migrants and less educated migrants while the implication for the non-poor and more educated migrants appears to be negligible or even positive. This is intuitive because

poorer and less educated migrants have liquidity constraints to finance high migration costs (e.g., Dustmann & Okatenko, 2014).

Overall, the results in Table 4 and 5 suggest that besides the commonly studied push factors and constraints that migrants face at their origins, spatial attributes and associated economic opportunities at destinations influence migration patterns. This implies that in addition to the push factors at origin of migration, pull factors arising from improved welfare, cost of living and associated economic opportunities at neighboring areas are potentially triggering further migration. The differential implications of these spatial attributes and economic opportunities at destinations on various types of migration is also noteworthy in terms of informing youth migration policies in Africa. Indeed, these results suggest that addressing potential migrants' pushing factors and constraints at origin of migration may not sufficiently address youth migration in the presence of strong pull factors at destinations. This further reinforces the view that migration decisions and patterns are complex and addressing them requires coordination and addressing both push and pull factors of migration.

5.2. Destination choice of migrants: relative attributes

Migration theories and some empirical studies suggest that migrants would consider relative attributes (difference in attributes between the destination and origin of migration) before making their migration decision and choices (Findlay, 2011; Christiaensen et al., 2019, De Weerdt et al., 2020). These comparisons could involve relative welfare levels, cost of living, employment opportunities, urban intensity, agricultural potential, and land availability. To examine the implication of relative attributes, we compute spatial difference in key observable attributes between potential destination states and origin of location before migration takes place.

Table 6: Destination choice of migrants: The role of relative attributes

Relative attributes	(1)	(2)	(3)	(4)	(5)	(6)
	Any type of migration	Rural-rural	Rural-urban	Urban-urban	Temporary	Permanent
Differences in average consumption	0.003**	-0.065***	0.007*	0.020***	-0.004	0.010**
	(0.001)	(0.007)	(0.004)	(0.005)	(0.003)	(0.004)
Differences in consumer price index	-0.025	0.672***	-0.172***	-0.098***	0.014	-0.073**
	(0.020)	(0.057)	(0.029)	(0.038)	(0.026)	(0.033)
Differences in agricultural productivity	0.002**	0.026***	-0.003*	-0.002	0.003**	0.001
	(0.001)	(0.003)	(0.002)	(0.002)	(0.001)	(0.002)
Differences in average farm size	0.027***	0.107***	0.006	0.018***	0.029***	0.025***
	(0.003)	(0.007)	(0.004)	(0.006)	(0.004)	(0.005)
Differences in average nighttime light	0.012***	-0.010***	0.009***	0.024***	0.010***	0.013***
	(0.001)	(0.003)	(0.001)	(0.002)	(0.001)	(0.001)
Differences in long-term annual rainfall	0.023***	0.096***	0.015***	0.009**	0.021***	0.032***
	(0.002)	(0.005)	(0.003)	(0.004)	(0.003)	(0.003)
Ln(Distance to destination)	-0.762***	-0.731***	-0.434***	-0.257***	-1.961***	-1.935***
	(0.176)	(0.198)	(0.106)	(0.041)	(0.129)	(0.326)
Ln(Distance to destination) square	0.193***	0.234***	0.179***	0.172***	0.201***	0.160***
	(0.007)	(0.020)	(0.011)	(0.014)	(0.009)	(0.013)
Constant	0.427***	0.175***	0.450***	0.333***	0.682***	0.247***
	(0.020)	(0.017)	(0.039)	(0.009)	(0.017)	(0.015)
Individual fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	116439	13432	55951	31836	65479	41145

Source: Authors' calculations based on Nigeria LSMS-ISA 2010-11, 2012/13 and 2015/16 rounds and other geospatial data sources, including the national geophysical data center (NGDC) of the United States' National Oceanic and Atmospheric Administration (NOAA).

Note: Standard errors, clustered at LGA level, are given in parentheses with * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Results by poverty status of youth are represented in (column – 1 and 2): poor household are those households with per capita consumption below the poverty line ($1.90 in 2010 $ PPP), while non-poor migrant households are those whose per capita consumption level is above $1.90 in 2010 $ PPP. Educated migrants are those individuals with educational attainment level above the median years of schooling for youth in our sample (10 years), while less educated youth are those whose educational attainment level is below the median years of schooling**.** We have compared regression coefficients across groups using suest test. The results showed that most of the coefficients are statistically different across groups.

The first column results in Table 6 show that relative consumption differences encourage youth migration. Conditional on the other regressors, migrants prefer to move to destinations characterized by relatively higher welfare. This is consistent with evolving evidence showing that relative deprivation and poverty encourages migration (Kafle, Benfica, & Winters, 2020). Similarly, relative higher land availability, agricultural potential and urban intensity in destination states are more likely to attract youth immigrants. Relative land availability and urban intensity play significant roles in choice of migrant destination. This is consistent with previous migration models which show that differentials in expected wages, rather than actual wage differentials, influence the decision to and where to migrate (Harris & Todaro, 1970; Massey, Arango, Hugo, Pellegrino, & Taylor, 1993; Young, 2014; Gollin et al., 2016). These results imply that besides

the absolute spatial attributes of potential destinations, relative differences in these attributes between destination and origin of migration influences migration patterns.

The results in the remaining columns in Table 6 indicate that relative welfare, agricultural productivity, farm size and rainfall patterns are significantly associated with destination choice for rural-rural migration, while relative urban intensity plays a significant role for rural-urban and urban-urban migration. Migrants aiming to rural areas are less likely to move to destinations with higher relative consumption, while urban migrants are more likely to choose destinations with higher relative consumption. This might be driven by transaction and mobility costs and constraints. Relative agricultural productivity, land availability and rainfall appear to be important factors in rural-rural migration while they remain relatively less important for other types of migration.

The last two columns of Table 6 show varying responses to relative attributes across temporary and permanent migrants. Relative land availability, agricultural potential (proxied by long-term rainfall) and relative urban growth appear to be positively associated with temporary and permanent migration while longer distance discourages temporary and permanent migration to a potential destination. Furthermore, permanent migrants are more sensitive to relative cost of living and hence higher cost of living is associated with lower migration rates. This is theoretically intuitive because much of temporary migration entails short-term responses to seasonal labor demands while permanent migration implies longer term responses to pulling or pushing factors of migration (e.g., Chen et al., 2019).

6. Conclusions and Implications

Migration decisions are triggered by multiple pulling and pushing factors. There are relatively few quantitative studies of migration which explicitly focus on destination decisions and how destination attributes affect migration patterns. In this paper we study youth migrants' responses to observable characteristics of potential destinations and how these responses vary across various forms of migration: rural-rural, rural-urban, urban-urban; temporary and permanent migration. We focus explicitly on examining the role of observable attributes of potential destinations, both in absolute terms as well as relative to origin of migration. We also explore potential heterogeneity in the impacts of observable characteristics of potential destinations across various types of migrants. By doing so, this study aims to make a direct contribution to understanding pull factors

of youth migration using nationally representative data in Nigeria, a country characterized by relatively high rates of internal youth migration.

While our results are intuitive, and in many ways unsurprising, they do contribute to a more nuanced empirical understanding of how spatial differences in amenities, opportunities and other place characteristics drive the spatial reallocation of labor. We find that spatial attributes and associated economic opportunities at destinations strongly influence migration patterns. However, the response of migrants to observable characteristics of potential destinations varies across migration patterns (e.g., rural-rural versus rural-urban), duration of migration (temporary versus permanent) and socioeconomic status (e.g., poor versus non-poor). For instance, rural-rural migrants are more responsive to agricultural productivity, land availability and agricultural potential while rural-urban and urban-urban youth migrants are more responsive to welfare and urban intensity in potential destinations. Similarly, permanent migrants are more sensitive to characteristics of potential destinations than temporary migrants.

Distance between origin and potential destination of migration appears to be an important factor deriving migration to specific destinations. This is consistent with the findings by De Weerdt et al. (2020), who argue that distance is the most important determinant of choice of migration. Most importantly, distance induces different impacts on the migration choices of female versus male migrants, poor versus non-poor migrants, as well as more educated versus less educated migrants: longer distances discourage migration for female migrants, poorer migrants and less educated migrants, relative to their male, non-poor and more educated counterparts, respectively. This finding is intuitive, and likely reflects liquidity constraints of these groups for financing migration costs. This likely contributes to the sorting of migrants into cities and towns based on the above characteristics of migrants as well as other sources of heterogeneity in migration costs (De Weerdt et al., 2020; Lagakos et al., 2020).

We also examine the implication of relative differences in potential destination and origin of migration, including differences in relative welfare, urban intensity, land availability, cost of living and long-term rainfall patterns. The results show that migrants prefer to move to destinations with higher relative welfare indicators. This is consistent with evolving evidence showing that relative deprivation and poverty encourages migration (Kafle et al., 2020). On the other hand, relative cost of living discourages immigration, implying that migrants are less likely to move to relatively more expensive states. Similarly, relative land availability, agricultural potential and

urban intensity in destination states are more likely to attract youth immigrants. This is consistent with previous migration models and empirical studies which indicate that differences in expected wages and opportunities can influence the decision to and where to migrate (Harris & Todaro, 1970; Massey et al., 1993; Young, 2014; Gollin et al., 2016). These results indicate migration patterns are shaped not only by the absolute spatial attributes of potential destinations, but also by the relative differences in attributes between destination and origin locations. Because of data related limitations, our analysis has focused on state-level spatial characteristics. We acknowledge that there may well be important spatial variation in location characteristics and migration patterns at more disaggregated levels. To address this, it would be useful to conduct similar analysis with survey data that enables more geographically disaggregated dyadic comparisons, should such data become available in the future.

The results from our heterogeneity analysis show that relative agricultural productivity, land availability and long-term rainfall appear to be important factors for rural-rural migration while they remain negligible for other type of migration, consistent with the evidence that lack of these productive resources at origin of migration can trigger rural-rural migration (Lewin et al., 2012; Wineman & Jayne, 2016; Chamberlin et al., 2020). Permanent migrants are more sensitive to relative cost of living. This is theoretically intuitive because temporary migration mostly entails short-term responses to seasonal labor demands while permanent migration requires systematic responses to pulling or pushing factors of migration (e.g., Bryan et al., 2014; Chen et al., 2019). Similarly, non-poor migrants are more likely to choose potential destinations with higher relative welfare. This is intuitive mainly because migration involves significant transport, travel and search costs that can importantly affect poor and rich individuals differently (Lucas, 2001; Fafchamps & Shilpi, 2013; Lucas, 2015b; Amare & Hohfeld, 2016; De Weerdt et al., 2020; Lagakos et al., 2020).

Finally, the paper hints at the need to coordinate and address both push and pull factors to understand complex migration decisions and patterns. Our analysis suggests that policy makers could redirect and influence alternative migration patterns (e.g., rural-rural) as an approach for reducing youth unemployment and social tensions in congested cities and urban areas by improving agricultural production potential in rural areas. This suggests that future trends in movement could be modeled as a response to different investment strategies and regional growth trajectories. Such work may enable governments to be more proactive in guiding the role that migration plays in the ongoing economic transformations in the region.

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