"Decentralized Migration in Morocco"

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Demographic distributions of a country inevitably define policymaking, elections and development investments. Population subgroups and resources condense and disperse in geographically-defined areas, either organically or by design, eliciting calculated responses by the government. Therefore understanding the components of shifting population distributions should be an integral part of our understanding of development in the social sciences. However, the migration-development relationship is typically examined in terms of either international migration or rural-urban migration. As such, the urbanizing trend tends to dominate discussions of internal migration. Because the point of departure of many internal migration analyses is the urban center, there remains an urban bias to the conclusions that are drawn in internal migration studies, much like in many other development fields. Casual reference, at the most, is given to the other types of movement such as rural to rural, urban to urban and urban to rural. Given that people are more likely to move closer distances, and globally, there is a high correlation between development and the percent rural, it is conceivable that a substantial amount of the movement related to development remains within the rural areas. As such, in order to truly understand the impact that changing societies has on the population distribution of a country, capturing only the phenomenon of expanding cities, while important, is not sufficient. We must add to our stock knowledge of the determinants of internal migration the local micro-responses starting from the rural areas.

The following analysis contributes to the discussion on internal migration by presenting a quantification of the variation unexplained by rural to urban migration models. The analysis was performed in Morocco, using Census data and ArcGIS. The results explore the phenomenon of "decentralized migration," whereby semi-urban population centers are evolving in the rural areas and experiencing net migration inflows. The analysis points to a more complex dynamic than that of a simple rural exodus. The study starts by spatially observing rural to urban migration trends in Morocco between 1994 and 2004. It then moves on to observe movement trends unexplained by rural to urban migration. The study ends by proposing follow-up research to further understand and explain the development-induced movement that is not part of the urbanization process.

Theoretical Framework:

Historical and contemporary analysis asserts that movement is a function of development and industrialization. The narrative of changing societies and movement is referenced as early as in 1880, whereby one of his proposed "laws of migration" was the increase of migration with economic development. Zelinsky articulates more thoroughly the relationship between migration and development by linking mobility with modernization theory and demographic transition in what he called his "theory of mobility transition." He summed up his theory by stating "there are definite, patterned regularities in the growth of personal mobility through space-time during recent history and these regularities comprise an essential component of the modernization process." He, thus, characterized mobility as an inherent part of modernization and advocated a spatial-temporal approach to understanding migration building on the spatial diffusion of innovations. This theory was revised and built upon by Skeldon with his assertion

that echoed that of Ravenstein that the relationship between migration and development was curvilinear, such that, increases in development bring about increases in migration. Hein de Haas references this work heavily in his elaboration of what he refers to as "Transitional Migration Theory." More recently in a special issue of the *Journal of Ethnic and Migration Studies* entitled "Theories of Migration and Social Change" the case was more clearly made for viewing migration as a dynamic process in order to account for the "complexity, interconnectedness, variability, contextuality and multi-level mediations of global change" . In the same issue, Portes further echoed that statement but added to it by characterizing migration as a process of change embedded in the social structure.

In this theoretical framework, development is synonymous with societal transformation. Sectors at multiple levels of society are simultaneously expanding and contracting based on the global and local environment. Furthermore, individuals are making decisions based on these changes that further contribute as micro-movements to the overall changing society. Part of this decision-making process is the decision to move. This depiction of societal transformation, thus, incorporates a view for the macro, meso and micro levels of analyses , which conveniently all have a firm scholarly foundation in the migration literature . The macro level involves political economy analyses that identify and explain broader patterns, inherently linked to the external environment . Meso-level analyses involve sociological approaches that typically are concerned with social networks and social structure. For these scholars, the local environment serves as a prism through which to interpret and understand the global, macro-level realities . Finally, the role of micro-level decision-making is captured by the behavioralists that look at individual psychology as a primary determinant, or the New Economics of Labor Migration scholars who view household psychology as a primary determinant of the decision to move . There is no doubt

that each of these approaches makes an important contribution to our understanding of how societal transformation impacts population distribution. Unfortunately, to capture all of them into one model is unyielding and impractical. The following analysis is a macro-level observation of an understudied trend. To understand the complex components of this trend, research needs to be performed at each level of analysis. Therefore, much deeper meso and micro analyses should be performed in subsequent, follow-up research.

What happened in Morocco between 1994 and 2004?

In terms of societal transformation, the years between 1994 and 2004 in Morocco were remarkable. In general, the country experienced an unprecedented political opening, characterized by the acceptance of an opposition-led government in 1998 , the liberation of political prisoners and increased freedoms of speech. This trend developed even more momentum when King Hassan II, who led the country with an iron-fist for over 30 years, passed away in 1999 leaving the thrown to his son, Mohammed VI. Educated with a PhD in political science from France, it was clear from the start that the new King had a different concept of governance than his father that was more in line with modern principles of governance. Even more importantly, throughout the reign of Mohamed VI, priorities have made for investing in development, providing him with the nickname "The King of the Poor." One Moroccan observer summed up the difference by stating that "the priority of Hassan II was stability. The priority of Mohamed VI has been development." Another observer commented that, "after seeing the development investments that have been made in the past ten years, Moroccans ask themselves, where did all that money go during the reign of Hassan II?" There is no doubt that significant changes were observed throughout the country. According to World Bank figures,

from 1994 to 2004, the GNI per capita went from $2,940 to $4,460. The adult literacy rate jumped from 41.6 % in 1994 to 52.3% in 2004. The infant mortality rate fell from 54 to 36.1. These changes that may be reflected in our dataset only include the beginning of the reign of Mohammed VI. Even so, the years between 1994 and 2004 were a decade of impending political and economic change that was felt throughout the region.

Data

The data comes from the Moroccan census bureau, *Haut Commissariat au Plan* (HCP) for the years 1994 and 2004. The analysis years have been chosen due to availability. The Moroccan census is the most comprehensive dataset that reflects population changes in the country. It is performed every ten years with the 2014 census currently underway, the results of which should be available within the coming year. The dependent variable in this analysis, *estimated net migration rate (ENMR)*, was calculated according to the following equation:

Population Change – Natural Increase = Crude Migration

Natural Increase is usually calculated by subtracting deaths from births in a given year. However, these data are not available in Morocco at the level of the commune. Furthermore, due to under-reporting of births and deaths in the rural areas, figures would be suspect if they were to exist. As such, the HCP estimated their own figures for the rate of natural increase based on whether an area is classified as rural or urban . Since population data also have a percent-rural

and a percent-urban classification by commune, an estimated rate of natural increase was possible to calculate. [1]

Analysis and Findings

The first step of the analysis was to test the legitimacy of the calculated ENMR and to examine the distribution of the variable. Since previous literature demonstrates a clear relationship between development and movement, if the calculated variable is correct, we would expect to see clear correlations between development indicators and movement. The following correlation table demonstrates that indeed, the ENMR correlates with every single development indicator in our dataset, as expected. This observation contributes to our level of confidence that the calculated variable does indeed measure what it is intended to measure.

[1] Calculation of the DV:
Net Migration Rate (NMR) = Rate of Population Increase (RPI) – Rate of Natural Increase (RNI);
RPI = [(Populationt1 – Populationt)/Popt]*100;
RNI= (Crude births1994 through 2004 – Crude Deaths1994 through 2004)/10
1 Crude birth and death figures do not exist by commune. What does exist is an estimated crude birth and death rate by thousand inhabitants for rural areas and urban areas.
RNI by commune = (%popRural*RNIRural)+(%PopUrban*RNIUrban)
The HCP estimated birth and death rates only existed at select years. The following equation was used to interpolate the missing years. t+(t+1)/(t1-t)Crude birth and death figures do not exist by commune. What does exist is an estimated crude birth and death rate by thousand inhabitants for rural areas and urban areas.
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Table 1: Correlations with development indicators

Column1	Electricity	Satellite Dish	Paved Roads	Owned property	Potable Water	ENMR
%Electricity		0.000	0.000	0.000	0.000	0.000
%Satellite Dish	0.000		0.000	0.000	0.000	0.000
%Paved Roads	0.000	0.000		0.000	0.000	0.000
%Owned property	0.000	0.000	0.000		0.000	0.000
%Potable Water	0.000	0.000	0.000	0.000		0.000
ENMR	0.000	0.000	0.000	0.000	0.000	

When examining the data for normality, ENMR had a positive skew driven by a few outliers and extreme values (see figure 1). When we examine these outliers on a map, it is clear that many are located in the Western Sahara region. Western Sahara is a disputed territory, the result of which is a huge economic investment on the part of the Moroccan government to try to make the case politically that the territory is indeed part of Morocco. Given that this explanation is unrelated to the process of development and therefore, not within the parameters of the study, the extremeness of these values should not be considered in the analysis.

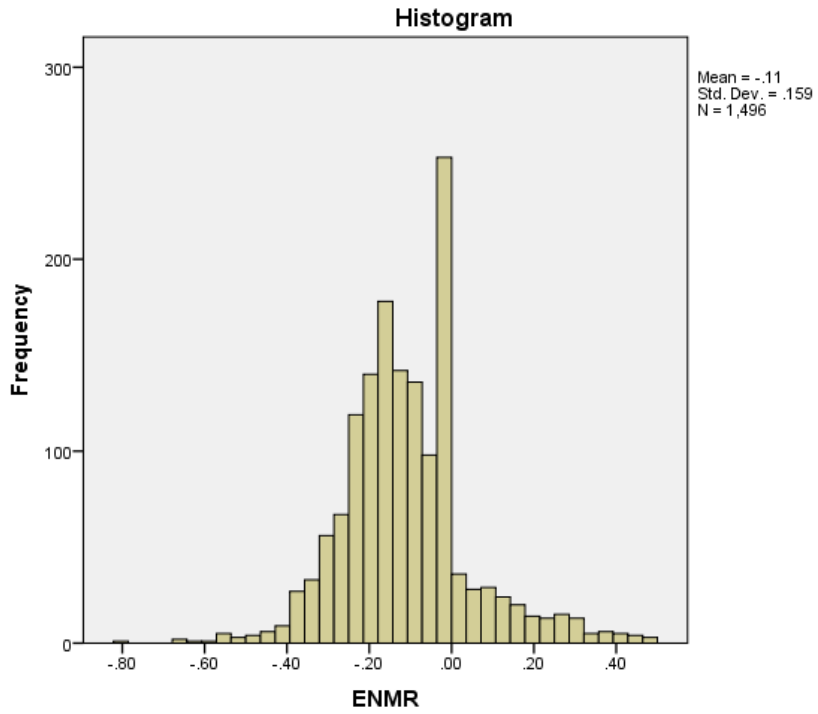

Figure 1: Frequency Distribution of ENMR

When excluding the extreme values and examining the range of ENMR values from the lowest through to .50, we

observe what looks close to a normal distribution. By examining the frequencies, we also learn that the majority of the communes are experiencing a net migration loss with a mean value of -.11. We also see a spike in frequencies just below zero, indicating that there are a disproportionate number of communes that experienced only a slight net outflow. In the entire dataset, only 399 communes out of 1550 are experiencing net migration gains which amounts to 26% of all communes. Not surprisingly, all of the major cities are located within this group. These figures support the rural to urban migration models by depicting a general concentration of population in certain areas, including major cities. We would suspect these figures to be representative of the urbanizing trend.

However, what we find is that of the 399 communes that are experiencing net migration inflows, only 166 of them are classified as urban areas by HCPs definition. This amounts to only 42% of the communes experiencing migration inflows. Therefore, 58% of communes experiencing inflows are classified as rural communes. Furthermore, 50 out of 249 urban centers experienced a net migration loss. This means that there are urban centers that are losing people which is also counter-intuitive given the rural to urban migration phenomenon.

Next, I examined the geographical nature of the variable by mapping the ENMR in ArcGIS. Given the premise of rural to urban migration, I expected to see high ENMR values in and around the major cities with low values in the rural areas (See figure 2). This trend was apparent in the visualization, with dark blue areas representing high migration inflows and appearing in particular around the major cities marked with circles around them. We also observe the majority of the country that is experiencing a net migration loss represented by the colors green, orange and red, seemingly situated in between all the major cities. These initial observations provide more evidence of the rural to urban migration trend that has already been well-established, giving us more confidence that the variable is indeed an accurate depiction of movement patterns.

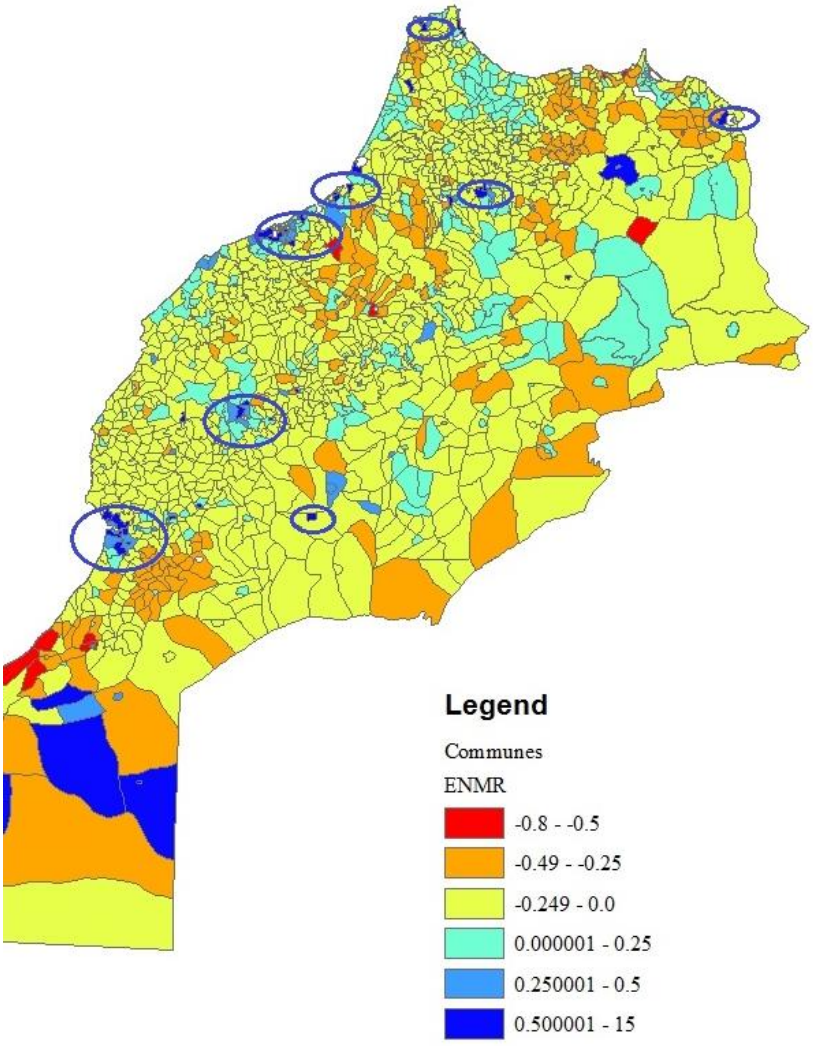

Figure 2: ENMR by commune

In order to statistically examine this trend, I first tested for spatial autocorrelation, using ArcGIS's Moran's I Spatial autocorrelation tool from its spatial statistics toolbox. Not

surprisingly, the test produced a p-value > 0.001, which confirms that the geographic distribution of the ENMR is not random. I then performed a cluster analysis using ArcGIS' Anselin Morans I tool, which identifies the areas in which we see statistically significant clustering.[2] Indeed, we find clustering of high migration values around the major cities. This trend is marked in the map by communes colored in black. We also see clusters of low migration values marked in the map by the color green. Another item this test produces is areas where a commune experiencing high migration values is surrounded by communes experiencing low migration values. This is represented by the color orange. While the direction of the movement is not captured in this dataset, these instances could be depicting some of the local non-urban population concentration. The final item produced by the map are areas where low migration values are surrounded by high values. These areas are represented by the color green.

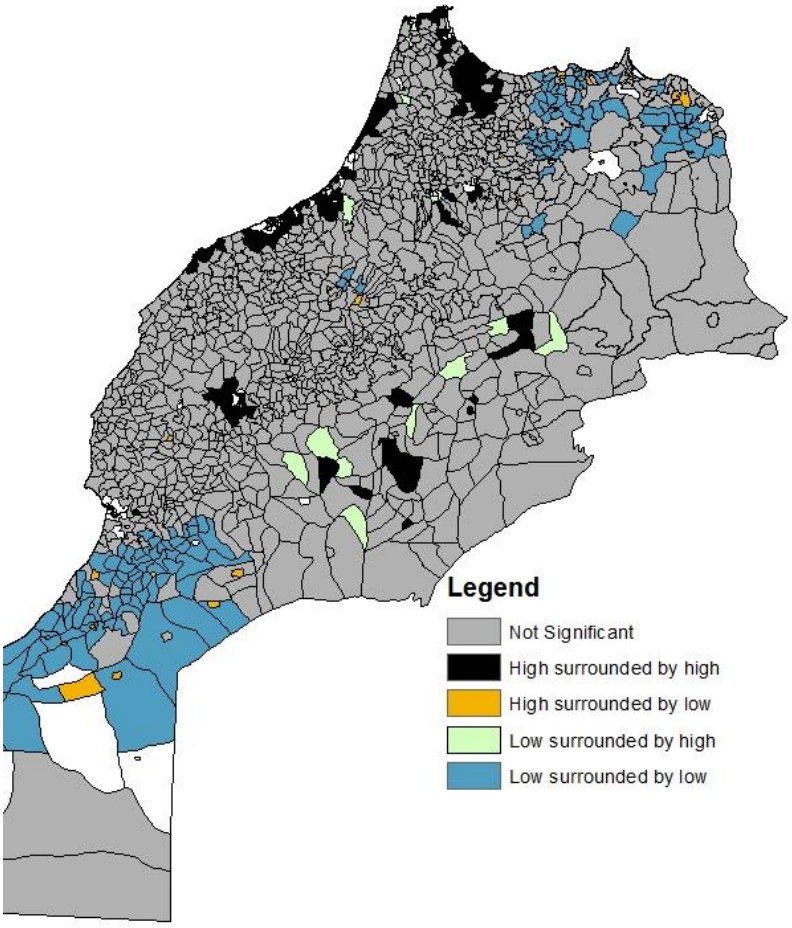

Figure 3: Statistically significant clusters of ENMR

Since the phenomenon of growing cities is well-established, the next step of the analysis is to examine only the

[2] Zone of indifference was used to conceptualize the spatial relationship and Euclidean distance was used as the method.

positive values that are not related to this phenomenon. To do this, I created a new shapefile by doing an inverse selection of communes that are urban and/or adjacent to and urban center in order account for potential urban sprawl. I, then, exported the selection to a new layer that now represents only the communes that are experiencing net migration inflows, but are not urban and are not located adjacent to an urban center (see figure 3). This new layer amounted to 131 communes. This indicates that out of 399 areas that are receiving migrants, 131 are not urban, nor are they located anywhere near an urban center. This amounts to 33% of the communes experiencing net migration inflows. It should be noted that when a commune is documented as having increased or decreased, what is not specified is where within the commune the population change took place. Therefore, counting any commune that touches an urban center is an extremely conservative estimate. There are likely instances where the population increase that took place in the commune was located far away from the urban center that touches the commune's borders that excluded it from our dataset. As such, the actual figure for communes with an increasing population unrelated to urban centers is likely to be higher.

In this map, red represents communes experiencing net migration inflows not explained by urbanization, and the black areas represent urban centers. In this visualization, we see a seemingly random distribution of communes experiencing migration inflows in relation to the location of urban centers (see figure 4). These communes signify the variation unexplained by rural to urban migration models.

Furthermore, while many urban population centers are experiencing net migration increases as would be expected, there are also many urban population centers that are not experiencing net migration increases. These areas are represented by black spots that ae not located near any of the red communes. Some urban centers are even losing population. This

observation indicates that there is not an even distribution of positive migration rates among urban population centers.

This initial analysis begs the question, what is the variation that is not explained by what we know of rural-urban migration phenomenon? In other words, why are people moving to these communes that are not urban centers? And, why do some urban centers increase in population while others that are comparable do not? To move further in the analysis, a new dataset was created that includes only the movement not explained by standard rural to urban migration trends. To create this dataset, the new layer that was created to represent the communes experiencing a net migration positive not adjacent to an urban center was joined to the original dataset. A new field was then created as a dummy variable. The dataset was subsequently exported into SPSS to lay the groundwork for further analysis.

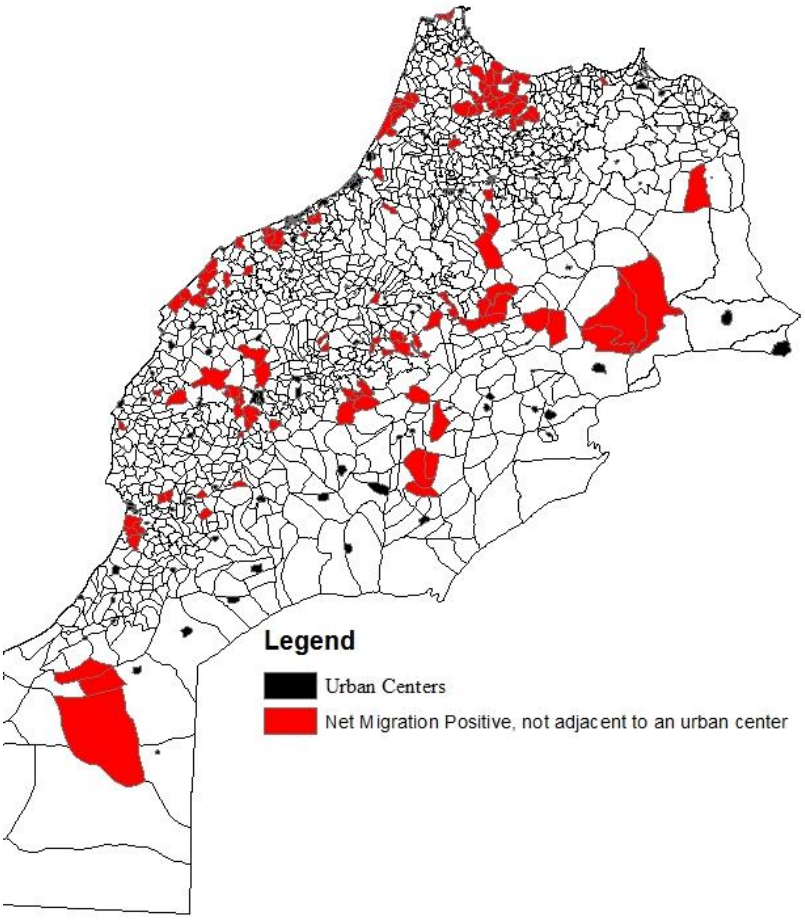

Figure 4: Communes with net migration in flows unrelated to urbanization

One potential explanation for the increase in migration to these areas is what Hein de Haas called the "decentralization of migration" in Morocco . This is when people opt to move to local growing population centers in the rural areas.

This paper contributes to discussions on the relationship between migration and development by presenting the argument that internal migration is more complex than the rural to urban migration models allow for. The narrative of rural exodus accounts for one aspect of the ways in which the rural sector adapts and changes with development. But as the above analysis illustrates, more than half of the areas that experienced migration inflows are not urban areas. And a third of these communes are located far away from urban centers. Furthermore, there were many smaller urban areas that did not experience inflows and some that even experienced outflows. Therefore, many questions still remain with respect to who goes where, why and what is the degree of permanence of these moves if we are to truly understand the impact that development has on internal population movement? As such, further study is necessary to identify the determinants of non-urbanization migration, or decentralized migration.

If economics is indeed such a strong determinant of migration patterns as classical models and assumptions indicate, then it is logical to assume that migration patterns in developing countries would match the complexity of the economics in transitioning societies. As such, explaining movement only in terms of rural to urban migration should seem short-sighted and insufficient. Economic transition occurs at multiple levels in society inflicting a variety of different consequences on individuals. Different income brackets, industrial sectors and geographical areas will no doubt respond to these changes in different capacities. The task is then to identify what are the patterns. Is each case of decentralized migration a phenomenon unto itself, or are there general trends that can inform policymakers and forecasters?

Given the complexity that is being proposed of explaining migration patterns, it would be tempting to suppose that a case study of Morocco would not be applicable to any other context.

However, we know that even though economies in transition are unique, there are indisputable commonalities between countries at similar stages of development. Indicators such as pollution, corruption levels, health indicators, even traffic mortalities all have very similar trajectories when analyzing them as a function of development. Therefore, the correlates of development are plenty. And trends observed in a case study of Morocco could very well inform universal patterns given a set of similar conditions. However, correctly identifying the relevant conditions is crucial to any such endeavor. The way to move further in this analysis is to take a deeper look into these aberrant migration trajectories and understand their underlying causal processes.

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