Regional comparisons of intergenerational social mobility: the importance of positional mobility.*

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Abstract

In this paper, I show that the decomposition of intergenerational persistence indicators into their structural and positional components offers a clearer understanding of the determinants of the heterogeneity in subnational mobility rates. The crucial element for the separate analysis of positional and structural mobility is the use of regionally defined instead of nationally defined quantiles. This constitutes a departure from the current consensus in the estimations of mobility rates at the subnational level in economics. Using the Mexican case as an example, I show that there are no significant differences across the country's regions in terms of positional mobility. This contrast with the existing results and their interpretations, particularly regarding intergenerational mobility in the south region of the country. This highlights the importance of incorporating positional measures into the battery of tools used for intranational analysis.

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1 Introduction

One of the most active areas of economics research on intergenerational social mobility is the study of intranational heterogeneity in the patterns and determinants of mobility. However, existing research[1] has left aside the analysis of intranational differences in positional mobility across a country's regions. In this paper, I contribute to filling this void by providing the first set of strictly positional measures of regional intergenerational mobility for Mexico. In contrast with previous estimations of regional patterns of intergenerational mobility (Vélez-Grajales et al., 2018; Delajara and Graña, 2018; Monroy-Gómez-Franco and Vélez-Grajales, 2021; Delajara et al., 2022), I do not find differences in rank persistence and aggregate persistence measures for the Mexican regions. The reason for the difference in results is that previous estimates employed as reference group the national distribution, which leads to a mixing of the structural and positional mobility patterns, as shown by Deutscher and Mazumder (2021).

Following Markandya (1982, 1984), let the marginal distribution of life outcome y at time t be defined as $g(y_{i,t})$, the marginal distribution of the same life outcome at time $t-1$ as $g(y_{i,t-1})$ and the corresponding joint distribution as $f(g(y_{i,t-1}), g(y_{i,t}))$. Then, it is possible to define *structural mobility* as the changes in the marginal distributions between t and $t-1$ maintaining constant the relative position of each i. In contrast, *positional or exchange mobility* is concerned with the changes in the position occupied by person i between t and $t-1$, holding constant the marginal distributions. In other words, *structural mobility* refers to the changes in the marginal distributions between two generations, while *positional mobility* refers to the changes in the copula that links the positions for the same individual across both marginal distributions.

The joint analysis of both mobility concepts has been the focus of most economics research[2], particularly that arising from traditional economic models of intergenerational mobility such as Becker and Tomes (1979, 1986) and Becker et al. (2018). However, for this literature, positional mobility is only a side product of the different intergenerational dynamics in absolute terms of the households in the population, and it is not relevant by itself. This is a direct result of the assumption that a person's utility function is defined only in terms of absolute consumption, which implies that there are no effects associated with being located at a specific part of the distribution of economic resources.

[1] See Chetty et al. (2015); Heidrich (2017); Delajara and Graña (2018); Corak (2019); Connolly et al. (2019); Eriksen and Munk (2020); Deutscher and Mazumder (2020); Monroy-Gómez-Franco and Vélez-Grajales (2021); Delajara et al. (2022); Acciari et al. (2022) for recent examples of this literature.

[2] See Fields and Ok (1999); Jäntti and Jenkins (2015); Durlauf et al. (2022) for surveys of the economics literature on intergenerational social mobility.

The existing research on intranational regional differences in intergenerational mobility patterns at the regional level has followed a similar approach. The seminal work by Chetty et al. (2014, 2015) introduced the use of nationally defined ranks as the dimension of analysis upon which the different regional patterns of intergenerational persistence are to be compared. Although originally motivated by the data restrictions faced by the authors, the approach is also consistent with a hybrid interpretation of intergenerational mobility in which the concepts of structural and positional mobility are mixed. On the one hand, changes in the position of a household from a particular region in the national distribution between two generations imply changes in the absolute level of resources accessible to that household, thus implying structural mobility. On the other hand, it also captures persistence (or the lack thereof) at a specific part of the national distribution, thus implying positional mobility with respect to the national distribution, but not necessarily the regional distribution.

The main limitation of this approach is that, by definition, it limits the possibility of identifying if the main driver of the observed intergenerational mobility patterns is structural or positional mobility. In this paper, I seek to contribute to the existing literature on regional differences in social mobility by showing that focusing on positional mobility can provide a deeper understanding of the regional differences. This implies opening a research agenda that has not been explored so far in the literature while simultaneously complementing the existing findings for the Mexican case.

The rest of the paper proceeds as follows. In the following section, I discuss the importance of analyzing positional intergenerational mobility at the subnational scale, emphasizing how it complements the existing literature on regional differences in mobility. Next, I describe the different measures of intergenerational mobility used in the paper, emphasizing their positional interpretation. In the fourth section of the paper, I describe the main characteristics of the database employed, as well as the construction process of the outcome variable. The dataset can be considered an example of the type of data set employed for social mobility analysis in contexts where panel databases are non-existent or non-intergenerational. After that, I present the results for positional mobility across Mexican regions, showing how they complement the existing results and provide a better insight into the determinants of regional differences in mobility. Finally, I discuss some final remarks and future avenues of work.

2 Positional mobility and regional intergenerational mobility

As mentioned above, positional intergenerational mobility refers to the changes in the position occupied by a person in the distribution of a particular outcome with respect to the one occupied by her predecessor in the corresponding distribution, assuming that the marginal distribution of the outcome variable remains constant between the two cohorts. The relevance of this concept of social mobility arises from two growing bodies of economics literature: the analysis of positional concerns in terms of welfare and the political economy of social mobility and elite circulation.

2.1 Positional concerns: the microeconomics of positional mobility

A growing body of literature finds that individuals care not only about their absolute level of consumption or income, but also about their position with respect to different reference groups[3]. The existence of positional preferences has been identified in societies across the world, from European (Clark and Senik, 2010; Garratt et al., 2016; Mujcic and Frijters, 2012), to Latin American (Esposito and Villaseñor, 2019; Castilla, 2012; Kuegler, 2009), North American (Luttmer, 2005; Japaridze and Sayour, 2021), African (Kingdon and Knight, 2007; Akay et al., 2014; Lentz, 2017) and Asian societies (Clark et al., 2022; Knight et al., 2009; Carlsson et al., 2008; Carlsson and Qin, 2010). Similarly, research identifies that positional concerns are present in multiple domains and that they are particularly strong for goods in which comparisons are socially invited, such as income, wealth, education, and several types of durable consumption goods (cars, houses, among others) (Birdal and Ongan, 2016; Bogaerts and Pandelaere, 2013; Carlsson et al., 2007; Murphy and Weinhardt, 2020).

These findings have a direct implication for the literature on intergenerational social mobility, as they suggest that persons base their decisions considering their implications on their relative standing with respect to other members of society. In the framework proposed by Becker et al. (2018), this implies that parental investments are made not only to improve the absolute income of the descendants but to guarantee persistence at or mobility towards the upper echelons of the distribution of economic resources in society. In other words, parental investments are made with a specific result in terms of *positional mobility* in mind[4]. Furthermore, this implication is strengthened when considering the existence of last place aversion (Kuziemko et al., 2014), as it implies that parents will seek to avoid the scenario where their descendants end at the bottom of the distribution.

The second implication is the need to identify the relevant distribution (or reference group) upon which individuals evaluate their positional mobility experience. As Deutscher and Mazum-

[3]See Weiss and Fershtman (1998); Heffetz and Frank (2011) and Clark et al. (2008) for surveys of this literature.

[4]For a theoretical discussion on how positional mobility can affect the utility of an individual, see Markandya (1982, 1984).

der (2021) show, using the national distribution to compare mobility patterns at the regional level ends up producing measures of mobility that do not adequately capture the positional mobility inside each region. However, this would only be a problem for positional analysis under the traditional framework of mobility analysis (i.e. Becker et al. (2018); Becker and Tomes (1986)) if individuals use as a reference group the regional and not the national distribution. If that is not the case, the current practice of using the national distribution as reference group would be a correct way of measuring positional mobility, as Chetty et al. (2015) and Acciari et al. (2022) argue.

The literature on reference groups has relied principally on experimental methods to identify the relevant comparison group in different dimensions. For example, Falk and Knell (2004); Lentz (2017); Chang (2013) and Pérez-Asenjo (2011) show that individuals are more likely to compare themselves with those that are perceived to be similar in characteristics such as education level, age, and gender. Moreover, Mageli et al. (2022); Lentz (2017) and Celse (2018) show that positional concerns arise when the comparison occurs against a member of society outside the close networks of the person. An unfavorable comparison against a similar but unfamiliar member of society produces a loss of welfare in the respondents. There is no effect when the comparison is made against a member of the person's network. However, Carlsson et al. (2008); Knight et al. (2009); Kingdon and Knight (2007); Davis and Wu (2014) and Bhuiyan (2018) show that positional concerns increase when the reference group is part of the same ethnic group or region as the person. These results imply that for the analysis of regional differences in positional mobility, the relevant reference group from the point of view of the observation unit is the regional distribution of the outcome variable, not the national one. This provides further evidence in support of the argument made by Deutscher and Mazumder (2021) regarding the interpretation of the existing results based on nationally defined ranks.

In the specific case of Mexico, Castilla (2012) and Esposito and Villaseñor (2019) show that positional concerns are present in the realms of income and education. Moreover, Esposito and Villaseñor (2019) show that, at least in the realm of education, the relevant reference group is the region the person inhabits, not the national population. Both results support the approach of this paper of analyzing regional differences in intergenerational mobility from a positional point of view, using the regional distributions of economic resources as reference groups.

2.2 The political economy of social mobility and elite persistence.

In contrast with the literature on positional concerns that focuses on individual welfare, the political economy literature on elite persistence and social highlights the relevance of positional mobility from an institutional perspective. Although less abundant in economics than the literature on positional concerns, this literature highlights the institutional mechanisms through specific groups in society persist at specific points of the distribution of economic resources and, consequently, diminish the rate of intergenerational positional mobility in society.

A strand of this literature has focused on the theoretical analysis of the different mechanisms through which elites can capture institutions and implement economic policies that guarantee their persistence at the top of the distribution of economic resources. The seminal work in this area corresponds to Acemoglu and Robinson (2008). They emphasize under which conditions transformations of the formal institutional environment do not modify the distribution of economic resources in society due to the countervailing influence of *de facto* political power. In other words, they highlight how those at the top of the economic distribution can derail any change in the formal institutions that might reduce their persistence at the top by making use of the influence they have on the command of resources and, consequently, in their distribution. Albertus and Menaldo (2014)) provide empirical support to this hypothesis. The authors show that the relative political power of elites during transitions to democracy impacts the level of inequality observed in the country once democracy is fully in place. In societies where economic elites had a solid political position during the transition to democracy, the implementation of democratic institutions had a smaller effect on the distribution of economic resources than in the societies where the elites were weakened at the moment of the transition.

These results have implications regarding positional social mobility. In the case of elites, they have a clear incentive to diminish the accession of "non-elite" members of society to the top of the distribution, as that would imply their displacement and a reduction in their political power. Consequently, less upward positional mobility is observed in societies where elites retain more political power. This would be particularly the case concerning transitions to and from the top of the distribution of economic resources, which are the positions occupied by the elite. Figueroa (2008); Rahman Khan (2012) and Bavaro and Patriarca (2022) discuss several of the different mechanisms through which elite members can curtail positional mobility. In particular, Figueroa (2008); Palma (2020) and Bavaro and Patriarca (2022) highlight the role of institutional arrangements that disincentivize the participation of challengers in the markets that provide membership to the elite. For example, Bavaro and Patriarca (2022) analyze the role of referrals in restricting the number of competitors for positions and how they benefit the members of the already existing network of elite members.

Acemoglu et al. (2017), derive another implication concerning the relationship between democracy (and inclusive institutions) and positional mobility. They show that positional mobility can be, under certain conditions regarding the distribution of perceived mobility, a destabilizing force for a democratic regime. For example, if the median voter expects to move upwards in the distribution and become part of the elite, she will prefer an institutional setup that guarantees that power remains in the hands of the elite in the future over a democratic arrangement. In contrast, when the median voter expects a political takeover by the elite in the future, she is incentivized to maintain democracy if her perceived mobility does not guarantee her elite membership

Both implications highlight the importance of analyzing positional mobility patterns to understand better the institutional arrangement regarding the distribution of resources in a society. This is consistent with the emphasis of stratification economics on the hierarchical organization of society and how members of each echelon will deploy different resources to defend their position or climb in the social hierarchy (Darity Jr., 2022). Similarly, it is consistent with the sociological literature on Effectively Maintained Inequality (Lucas, 2017), which highlights how elite members modify the institutional landscape once a particular educational level has reached saturation to maintain privileged access to the subsequent educational levels.

The existing evidence for Mexico highlights the regional or local character of the relationship between the capacity of elites to modify the institutional order to guarantee their persistence at the top. Garfias (2018) finds that during the Great Depression, local elites that experienced a negative shock in their resources due to the fall in commodity prices were more likely to face expropriations by the state and see their lands redistributed among the agricultural workers than local elites not engaged in the production of commodities. Thus, the particular regional conditions are crucial for the capacity of elites to maintain their position, providing another reason to focus on positional mobility using the regional distribution of economic resources as the reference group.

3 Measures of positional intergenerational mobility at the regional scale

The basis of positional mobility measures is the construction of a ranking based on the origin and current distribution of the outcome variable of interest and the corresponding copula that links both distributions. However, as Deutscher and Mazumder (2021) remark, a critical factor in determining if the concept of mobility being measured is positional mobility or something else is how the cut-off points of the rankings are defined. To see this, Deutscher and Mazumder (2021) define $F(\cdot)$ as a strongly positional mobility measure if it fulfills the following condition for the current $(y_{i,t})$ and origin $(y_{i,t-1})$ distributions of the outcome variable

$$F(g(y_{i,t-1}), h(y_{i,t})) = F(y_{i,t-1}, y_{i,t}) \; \forall g \text{ and } h \text{ monotonic and increasing} \tag{1}$$

In words, $F(\cdot)$ can only be considered a strongly positional measure of intergenerational mobility if changes in the marginal distributions of the outcome variable do not produce a change in the measured mobility. Thus, it only captures the changes in the copula joining both marginal distributions.

Consider then the case of intranational regions, the regional distributions of the outcome variable, and its distribution at the national level. The national distribution is the joint distribution of the regional ones. If the objective is to measure positional mobility at the national level, then measures of mobility defined over the national quantiles will fulfill equation 1. However, if the objective is to measure mobility at the regional level, that is no longer the case. The reason is that changes in the regional marginal distributions lead to changes in the position occupied by the origin or current household in the corresponding national distribution, even when those changes do not affect the copula of the regional distributions. Thus, using nationally defined ranks to assess mobility patterns at the regional level, as Chetty et al. (2015) and subsequent literature do, does not fulfill the condition in equation 1. Consequently, those results cannot be interpreted as positional mobility but instead as a hybrid measure of positional and structural mobility.

The solution to this problem is to rank the members of each region separately. In other words, to produce rankings based on the regional and not the national distribution. By doing that, changes in the regional marginal distribution will not affect the regional copula linking the positions between the origin and current distributions. This means that mobility measures calculated using the regional distributions and ranks as support will fulfill the condition in equation 1, allowing them to measure positional mobility correctly. Moreover, and as explained in the previous section, defining the regional distribution as the reference group upon which ranks are calculated is consistent with the findings on positional concerns and political economy that deal with positional mobility.

Besides this decision on the reference population, I will rely exclusively on mobility measures based on rankings in the following analysis. Specifically, I will employ the rank-rank persistence coefficient, transition matrices, and several indexes that collapse the information in a transition matrix into a synthetic indicator As Nybom and Stuhler (2017) show, this type of measures of intergenerational mobility is more robust to life-cycle bias than traditional measures of intergenerational persistence, such as the intergenerational income elasticity. Moreover, it allows me to compare the findings of this paper with those of the previously existing literature for Mexico, specifically with those from Delajara and Graña (2018); Monroy-Gómez-Franco and Corak (2019); Monroy-Gómez-Franco and Vélez-Grajales (2021) and Delajara et al. (2022). In order to compare the effects of choosing the regional distribution instead of the national one, I will estimate the same battery of indicators using both rankings. That is, rankings constructed with regional thresholds and rankings constructed using the national thresholds.

The rank-rank persistence coefficient measures the average degree of persistence at a specific rank of the outcome distribution. Since the work by Chetty et al. (2014, 2015) it has become a common measure to compare mobility and persistence patterns across regions of a country, as it summarizes the persistence levels implied by the copula linking the origin and current distributions (see, for example, (Connolly et al., 2019; Corak, 2019; Heidrich, 2017; Acciari et al., 2022). Defining $R_{i,t}$ as the rank of individual i in the relevant distribution of the outcome at time t, and $R_{i,t-1}$ as the rank of the same individual in the outcome distribution corresponding to time $t-1$, the rank-rank persistence coefficient is the β coefficient of the following regression.

$$R_{it} = \alpha + \beta R_{i,t-1} + u_{i,t} \tag{2}$$

As Hertz (2008) shows, the persistence coefficient can be decomposed into two elements: one corresponding to the share of the persistence observed within the different groups that compose the population, and another corresponding to the persistence element arising from the differences between said groups. Formally, define $\hat{\pi}_r$ as the share of the total population that inhabits in region r, $\hat{\beta}_r$ as the estimate of the national rank persistence coefficient among members of region r, $\hat{\gamma}$ the region-size-weighted between group regression coefficient, the estimate variance of the origin rank R_{t-1} among members of region r as $\hat{\sigma}^2_{R_r,t-1}$, the estimate of the variance in the origin rank at the national level as $\hat{\sigma}^2_{R,t-1}$, and the estimates of the regional and national means of the current and origin rank as $\bar{R}_{t,r}$, $\bar{R}_{t-1,r}$ and $\bar{R}_t$, $\bar{R}_{t-1}$. Then, as Hertz (2008) shows, the coefficient of equation 2 estimated for the whole national sample can be exactly decomposed as follows

$$\hat{\beta} = \sum_{r=1}^{5} \hat{\pi}_r \left(\hat{\beta}_r \frac{\hat{\sigma}^2_{y_{r,t-1}}}{\hat{\sigma}^2_{y_{t-1}}} \right) + \hat{\gamma} \frac{\sum_{r=1}^{5} \hat{\pi}_r (\bar{y}_{t-1,r} - \bar{y}_{t-1})^2}{\hat{\sigma}^2_{y_{t-1}}} \tag{3}$$

The first term represents the within-region component, while the second represents the between-group component of such persistence. This decomposition can be interpreted in terms of structural and positional intergenerational mobility for the case of regional analyses on intergenerational persistence. If the marginal distributions of the different regions are equal, the between-region component should not contribute anything to the persistence at the national level, i.e $\hat{\beta}$ is determined only by positional mobility. If that is not the case, then $\hat{\beta}$ is at least partially determined by differences in structural mobility across the different regions. Notice that if ranks are defined using only the regional distribution as a reference, the second component should be equal to zero.

A limitation of the rank-rank persistence coefficient is that it cannot capture non-linearities in the persistence rate across different ranks of the origin distribution of the outcome variable. This limitation can be supplemented by employing transition matrices, which characterize the persistence rate at different points of the distribution of the outcome variable at the origin. Transition probabilities are defined as the conditional probability that a person with origin in rank j ($O = j$) reaches rank z in adulthood ($C = z$), where the maximum rank is k, which conventionally is set to be $k = 5$ (in other words, the ranks correspond to quintiles). Formally, this probability $P(C = z|O = j)$ is defined as a function of the population with origin in rank j (N_j) and the share population with origin in rank j and in rank z in adulthood ($N_{z,j}$):

$$\Omega_{z|j} = P(C = z|O = j) = \frac{N_{z,j}}{N_j} \text{ for } j = 1...k \text{ and } z = 1...k \tag{4}$$

These transition probabilities can be arranged in a matrix to characterize the mobility patterns at different parts of the relevant distribution. This is the transition matrix, $M_{o,c}$, which, assuming $k = 5$, is formally defined as follows:

$$M_{o,c} \equiv \begin{bmatrix} \Omega_{1|1} & \dots & \Omega_{5|1} \\ \vdots & \vdots & \vdots \\ \Omega_{1|5} & \dots & \Omega_{5|5} \end{bmatrix} \tag{5}$$

From the information in the transition matrix, it is possible to construct indexes that summarize both the degree of fluidity and immobility in the society from which the transition matrix was calculated. Among these indexes, In this paper, I consider the Prais-Shorrocks index (Prais, 1955; Shorrocks, 1978), and the immobility index (Symeonaki and Stamatopoulou, 2020).

The Prais-Shorrocks index is a synthetic measure that captures the degree of mobility observed in the transition matrix $M_{o,c}$ as a function of the deviations from the rank persistence depicted by the main diagonal of $M_{o,c}$. Defining $\text{tr}(M_{o,c})$ as the trace of matrix $M_{o,c}$, it is possible to define the Prais-Shorrocks index, $PS_{M_{o.c}}$, as follows:

$$PS_{M_{o.c}} = \frac{1}{k-1}\big(k - \text{tr}(M_{o,c})\big) \tag{6}$$

If $PS_{M_{o.c}} = 0$, it implies that there are no deviations from the main diagonal, so there is complete persistence at the origin positions. In contrast $PS_{M_{o.c}} = 1$, implies that the transition probabilities corresponding to each origin rank are the same. In other words, the probability of reaching any rank in the transition matrix is independent from the rank of origin.

The immobility index ($IM_{M_{o.c}}$), as defined by Symeonaki and Stamatopoulou (2020), is the share that rank persistence represents out of the total number of ranks considered in the transition matrix. This ratio is the rate at which a member of society is expected to persist at any given rank. Formally this is

$$IM_{M_{o.c}} = \frac{\text{tr}(M_{o,c})}{k} \tag{7}$$

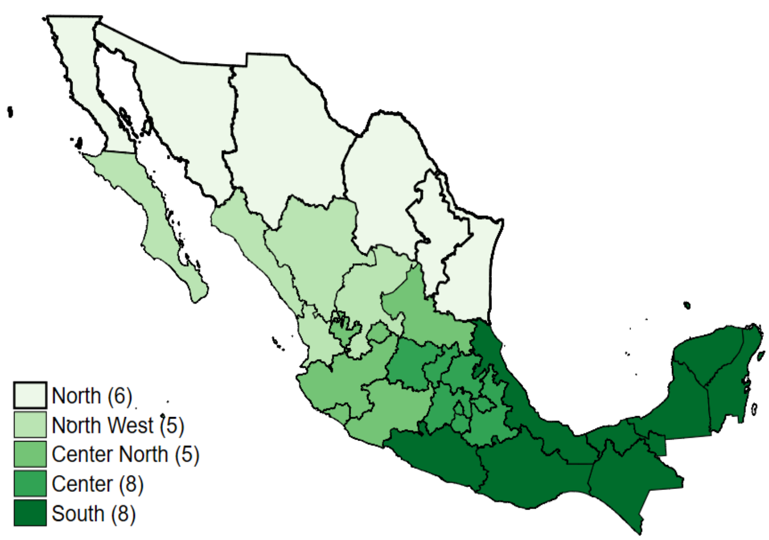
As in the case of the rank-rank coefficient, I estimate the transition matrices and the corresponding indexes using both nationally and regionally defined ranks in order provide a comparison between the positional mobility measure and the measure commonly used in the literature (see, for example Monroy-Gómez-Franco and Corak (2019); Monroy-Gómez-Franco and Vélez-Grajales (2021) and Delajara et al. (2022)).

4 Data

Although panel data represents the ideal data for intergenerational social mobility analysis, such datasets are not usually available in middle and low-income countries. Mexico is one of the countries in this situation, as there are no panel datasets that capture intergenerational information. An alternative is the use of retrospective surveys that recover information about the conditions of the household of origin of the interviewee. In this paper, I employ a database with these characteristics, the ESRU-EMOVI Social Mobility in Mexico Survey 2017 (EMOVI-2017). The EMOVI-2017 is a probabilistic survey representative of the Mexican non-institutionalized population between 24 and 65 years old. The survey includes a rich set of questions on the conditions of the household inhabited by the person when 14 years old and the conditions of the currently inhabited household. In particular, the survey recovers information on the types of durable goods, household appliances, and services available in both households. Similarly, the survey recovers information on the educational attainment and occupation of both the respondents and the parents.

EMOVI-2017 is the first survey with retrospective information with statistical representativeness at national and regional levels. This characteristic enables the comparative analysis of intergenerational mobility patterns between the country's regions. However, the regional representativeness of the EMOVI-2017 sample refers to a supra-state regional division of the country that divides the country into five regions constituted by different states. The regionalization of the country was based on the shared economic characteristics of the different states inside each region in 2017, adding geographical contiguity to this criteria (Centro de Estudios Espinosa Yglesias, 2019). This sample characteristic limits my capacity to disaggregate the analysis to perform state-level comparisons. Figure 1 shows the composition of the regions in the sample. The list of states that form each region are shown in Appendix A.

Figure 1. Geographical distribution of the different regions



It is important to note that the regional representativeness of the survey refers to the current region inhabited by the respondent, although it has information on the region of origin of the respondent. Due to the sample size, it is not possible to analyze in depth the determinants of the selection-into-migration at the regional scale, nor to study the impacts of internal migration on social mobility. As my interest is to analyze the patterns of intra-regional mobility across the country's different regions, I opt only to consider the population that, in 2017, remained in their region of origin. For this reason, my results should be interpreted as concerning the population that never migrated outside their region of origin.

The use of retrospective data for intergenerational analysis poses several. A first concern is the presence of recall bias. Recall bias arises from incorrect answers by the respondent regarding the living conditions of the household in which they lived when they were 14 years old. The questionnaire of EMOVI-2017 seeks to attenuate this bias in two ways. Firstly, the questions on the availability of household appliances and services use as the reference point for the respondent the situation when the person was 14 years old. There is ample evidence from neurosciences and memory research that strongly suggests that the events and situations that occurred during adolescence tend to be remembered more precisely than those that occurred at other stages in life[5]. By situating the reference point at this life stage, the survey seeks to improve the quality of the information recovered through the retrospective questions. A second strategy employed by EMOVI 2017 to reduce the effects of recall bias is that the questions on the durable goods and services available in the origin household only ask about access or ownership and do not require a full description or valuation of them. This reduces the demand on the memory of the respondent.

Another concern is life-cycle bias, which can exist if the interviewee's age and that of her parents at the reference point are very different. To attenuate this bias, I restrict my analysis to the cohort between 30 and 60 years old in 2017. This cohort would also represent individuals who are at their prime working age. As shown in Table 1, parents of this cohort had, on average, a very similar age at the reference point compared to the respondents in 2017. This helps to attenuate the concerns about life cycle bias affecting my estimations. Table 1 1 also shows two well-known facts about Mexican history during the last 40 years: an increase in the average educational attainment as the public education system expanded and an increase in the urbanization rate across all regions (see de la Torre and Vélez-Grajales (2016) for a further discussion on this facts).By focusing only on one cohort, I can abstract from the particular effects of this historical development on intergenerational social mobility that was not experienced by older cohorts.

As the questions about the goods and services were available in the origin and current households only recover ownership information, it is impossible to estimate a monetary valuation of the household wealth or income at both points. However, the information about ownership and access to the different goods and services implies the existence of a latent variable for both households that represents the household's economic resources and economic status. This latent variable can be estimated through a household asset index that summarizes the implicit information regarding the household's economic status in the multiple binary variables that describe the access and ownership of particular goods and services. This approach to the estimation of economic resources is frequently used in development economics (see, for example,

[5]On this subject see, among others, Janssen and Murre (2008); Murre et al. (2013); Kilford et al. (2016); Hartshorne et al. (2018).

Table 1. Descriptive statistics
(30-60 years old sample)

	National	North	North West	Centre North	Centre	South
Age of the respondent (Mean)	41.75 (0.112)	41.86 (0.196)	41.97 (0.190)	41.66 (0.269)	41.69 (0.234)	41.79 (0.186)
Age of parents at reference (Mean)	41.88 (0.108)	41.40 (0.228)	42.98 (0.356)	42.47 (0.311)	41.36 (0.227)	42.42 (0.234)
Women (Proportion of the population)	0.540 (0.009)	0.512 (0.016)	0.528 (0.014)	0.540 (0.012)	0.547 (0.017)	0.551 (0.019)
Indigenous (Proportion of the population)	0.125 (0.011)	0.042 (0.007)	0.039 (0.008)	0.052 (0.010)	0.096 (0.011)	0.299 (0.031)
Urban community of origin (Proportion of the population)	0.665 (0.017)	0.836 (0.019)	0.467 (0.055)	0.626 (0.047)	0.773 (0.024)	0.447 (0.037)
Urban community at the interview (Proportion of the population)	0.864 (0.013)	0.949 (0.012)	0.784 (0.041)	0.626 (0.047)	0.918 (0.020)	0.742 (0.034)
Average school years the parents (Mean)	4.40 (0.098)	5.06 (0.130)	4.19 (0.275)	4.23 (0.252)	5.05 (0.239)	3.03 (0.191)
Average school years of respondent (Mean)	9.80 (0.096)	10.31 (0.221)	9.83 (0.221)	9.30 (0.226)	10.41 (0.239)	8.74 (0.222)
Regional population (Proportion of national population)	1	0.162 (0.016)	0.066 (0.010)	0.142 (0.017)	0.392 (0.033)	0.238 (0.020)

Note: Standard errors in parentheses. Sample weights employed. The North region consists of Baja California, Sonora, Chihuahua, Coahuila, Nuevo León and Tamaulipas; North West consists of Baja California Sur, Sinaloa, Nayarit, Durango and Zacatecas; the Center North region is form by Jalisco, Aguascalientes, Colima, Michoacán and San Luis Potosí; the Center region is formed by Guanajuato, Querétaro, Hidalgo, Estado de México, ; Mexico City, Morelos, Tlaxcala, and Puebla; the South region is formed by Guerrero, Oaxaca, Chiapas, Veracruz, Tabasco, Campeche, Yucatán and Quintana Roo. The reference point corresponds to the moment when the respondent was 14 years old. Indigenous population is identified as those with at least one parent who spoke an indigenous tongue. Urban communities are defined as those communities with more than 1,500 inhabitants.

Filmer and Pritchett (2001); Filmer and Scott (2012); McKenzie (2005); Poirier et al. (2020); Wendelspiess-Chávez-Juárez (2015)). It also has been previously used to estimate social mobility patterns (Torche, 2015; Campos-Vázquez and Medina-Cortina, 2019; Vélez-Grajales et al., 2018; Monroy-Gómez-Franco and Corak, 2019; Monroy-Gómez-Franco and Vélez-Grajales, 2021; Delajara et al., 2022).

Table 2 describes the goods and services considered to construct both the origin and current household economic resources indexes. As all the assets considered are binary variables, the most suitable methodology to estimate the latent variable representing the household's economic status is multiple correspondence analysis (MCA). In contrast with other methodologies such as

Table 2. Goods and services employed to construct the economic resources index

Household asset/service	Household at 14 years old	Current Household	Household asset/service	Household at 14 years old	Current Household
Potable water	✓	✓	Water heater	✓	✓
Stove	✓	✓	Domestic service	✓	✓
Electricity	✓	✓	Cellphone		✓
Refrigerator	✓	✓	Toaster	✓	✓
Washing machine	✓	✓	Owner inhabited dwelling	✓	✓
Landline	✓	✓	Tablet		✓
Computer	✓	✓	Vacuum cleaner	✓	✓
DVD Player / Cassette recorder	✓	✓	Video-game console	✓	✓
Microwave	✓	✓	Car	✓	✓
Television	✓	✓	Dirt floor	✓	✓
Tractor		✓	Toilette facilities	✓	
Cable TV	✓	✓	Overcrowded household	✓	✓
Owner of another dwelling	✓	✓	Bank account	✓	✓
Owner of commercial premises	✓	✓	Credit card	✓	✓
Non-agricultural land		✓	Internet		✓

Principal Component Analysis (PCA), MCA relies on the relative frequencies of the different variables instead of using euclidean distances to estimate the latent variable representing the household's economic status[6]. Tables **??** and **??** show the coordinates assigned to each good or service of the origin and current index and their contribution to their explained inertia. This allows to identify which goods and services play a larger role in differentiating the economic status of households.

To produce robust results, I generate three series of rankings for the origin and current distribution of economic resources, dividing the distribution into 50, 20, and 10 quantiles for the estimation of the rank-rank persistence coefficient and into quintiles for the transition matrix-based indicators.

5 Positional mobility across Mexican regions

Table 3 shows the rank-rank persistence coefficient estimated over nationally and regionally defined ranks. As mentioned, the coefficient estimated using the national ranks corresponds to a hybrid measure of positional and structural mobility, while the one estimated on the regional ranks corresponds to a positional mobility measure.

The results for the hybrid measure are in line with previous findings in the literature (Delajara and Graña, 2018; Vélez-Grajales et al., 2018; Monroy-Gómez-Franco and Corak, 2019; Monroy-Gómez-Franco and Vélez-Grajales, 2021; Delajara et al., 2022): the south region has

[6]For a more extensive discussion of the method see Monroy-Gómez-Franco (2022)

the highest degree of rank persistence in the country, with the center of the country as the following region. On the other extreme, the most mobile region is the northeast. This ordering is robust to using more coarse partitions of the sample for the estimation.

However, the positional mobility measure results indicate that this ordering is a product of the dynamics of the regions in terms of structural mobility and not those of positional mobility. In contrast with the results of the hybrid measure, the results from the positional mobility measure indicate that, with the exemption of the northwest region, the rest of the country's regions exhibit a very similar rate of intergenerational rank persistence. This challenges the findings from the existing literature, which suggested that intergenerational mobility in the south region was substantially lower than in the rest of Mexico. My results show that the south has the same intergenerational positional persistence as the north or center regions. Thus, it cannot be considered a region "less fluid" than the others. In that sense, the hybrid approach seems to be heavily influenced by the very different macrodynamics of the south of Mexico, as initially suggested by Monroy-Gómez-Franco and Corak (2019).

Besides the last element, there are two other results. The first is that, similarly to the hybrid mobility measure, the northwest region has the lowest degree of positional persistence. This suggests that the positional mobility dynamics of the region dominate the structural ones and, in that sense, play a more prominent role in determining the rank persistence than in other regions. The second result is that the levels of positional persistence observed across all regions are high, even considering the northwest case. This suggests a pattern of elite persistence similar to the one identified for Peru by Figueroa (2008) and for Chile by Palma (2020).

The previous results suggest that Mexico is more homogenous than previously thought regarding positional mobility and that the existing literature are mixing the structural and positional mobility dynamics. To further investigate this issue, table 4 shows the decomposition of the national rank-persistence coefficient in its between and within components, following the exact decomposition proposed by Hertz (2008) and presented in equation 3. The results shown in table 4 correspond to the estimation of equation 2 using the ranking of 50 quantiles. As mentioned, the within region component corresponds to positional mobility of the region, whereas the between regions component correspond to the differences in structural mobility between regions.

The decomposition results suggest that the major contributor to the persistence rates observed in Mexico is the degree of positional persistence in the country and not the differences in structural mobility between regions. Furthermore, the positional mobility component in

Table 3. Rank-Rank persistent coefficient by region
(Percentiles defined over regional and national distributions)

Region	Type of measure	50 quintiles	20 quintiles	10 quintiles
North	Positional	0.507 (0.027)	0.534 (0.025)	0.537 (0.026)
	Hybrid	0.507 (0.024)	0.508 (0.023)	0.502 (0.022)
Northwest	Positional	0.416 (0.028)	0.435 (0.032)	0.433 (0.031)
	Hybrid	0.431 (0.033)	0.433 (0.035)	0.432 (0.036)
Center north	Positional	0.511 (0.027)	0.555 (0.026)	0.544 (0.027)
	Hybrid	0.495 (0.026)	0.497 (0.026)	0.496 (0.027)
Center	Positional	0.564 (0.029)	0.594 (0.029)	0.591 (0.029)
	Hybrid	0.609 (0.029)	0.613 (0.028)	0.608 (0.029)
South	Positional	0.559 (0.026)	0.533 (0.025)	0.547 (0.025=
	Hybrid	0.633 (0.029)	0.639 (0.030)	0.644 (0.030)

Note: Clustered standard errors in parentheses. Cluster unit is the primary sampling unit. Positional row corresponds to estimations based on regionally defined quintiles, while hybrid corresponds to the nationally defined quintiles. Sample weights employed. The North region consists of Baja California, Sonora, Chihuahua, Coahuila, Nuevo León and Tamaulipas; Northwest consists of Baja California Sur, Sinaloa, Nayarit, Durango and Zacatecas; the Center North region is form by Jalisco, Aguascalientes, Colima, Michoacán and San Luis Potosí; the Center region is formed by Guanajuato, Querétaro, Hidalgo, Estado de México, ; Mexico City, Morelos, Tlaxcala, and Puebla; the South region is formed by Guerrero, Oaxaca, Chiapas, Veracruz, Tabasco, Campeche, Yucatán and Quintana Roo. The corresponding regresions are presented in tables C1-C6 of the appendix and they only consider individuals who remained in the same region they were when 14 years old.

all regions is the principal contributor to rank persistence, highlighting the need to study it separately from the structural mobility one. The regions where positional persistence plays a higher role are the northwest, the center north, and the country's center. This implies that

Table 4. Decomposition of the national intergenerational persistence by region
(Coefficients scaled by population share)

Region	Within-group regression	Between-group regression	Total	Positional component (share of total)	Structural component (share of total)
North	0.069	0.017	0.086	0.798	0.202
Northwest	0.025	-0.001	0.024	1.049	-0.049
Center worth	0.063	0.004	0.067	0.947	0.053
Center	0.207	0.018	0.225	0.918	0.082
South	0.120	0.105	0.225	0.531	0.469
National	0.483	0.144	0.627	0.771	0.229

Sample weights employed. The North region consists of Baja California, Sonora, Chihuahua, Coahuila, Nuevo León and Tamaulipas; Northwest consists of Baja California Sur, Sinaloa, Nayarit, Durango and Zacatecas; the Center North region is form by Jalisco, Aguascalientes, Colima, Michoacán and San Luis Potosí; the Center region is formed by Guanajuato, Querétaro, Hidalgo, Estado de México, ; Mexico City, Morelos, Tlaxcala, and Puebla; the South region is formed by Guerrero, Oaxaca, Chiapas, Veracruz, Tabasco, Campeche, Yucatán and Quintana Roo. The regressions only consider individuals who remained in the same region they were when 14 years old and are estimated using the national ranks. Results from the regr .

in those regions, structural mobility has not been a relevant force in determining the mobility patterns of those regions. In contrast, the south is where structural mobility has played a more significant influence, representing 46% of the total rank persistence in the region.

Table 5 shows the results for the Shorrocks-Prais and immobility indexes estimated for the transition matrices constructed using the national (hybrid) and the regional ranks (positional). As in the case of the intergenerational rank persistence, the results for the hybrid concept of mobility imply that the south is the region with the highest level of persistence. In contrast, the positional mobility measure rejects this result, suggesting a level of persistence similar to the rest of the country.

An advantage of analyzing the full transition matrices is that they allow to identify the presence of non-linearities in the intergenerational persistence rate across the different ranks of the origin distribution of economic resources. Figure 2 shows the persistence probabilities at $O = 1$ and $O = 5$. In other words, the transition probabilities are at the origin distribution's extreme quintiles. Panels *a* and *b* show the persistence probabilities for the case of the matrices constructed using the regional quintiles, while panels *c* and *d* show the corresponding probabilities for the matrices constructed using the national ranks

The figure provides more information regarding the divergence between the results from the positional and hybrid mobility measures. Concerning positional mobility, panels *a* and *b* of figure 2 show that persistence at the top and the bottom of the regional distributions is relatively similar across the country. Moreover, they also indicate that persistence at the top is higher than at the bottom. The latter also occurs for the hybrid mobility measure. With the

Table 5. Mobility measures based on transition matrices
(Percentiles defined over regional distributions)

Region	Type of measure	$PS_{M_{o.c}}$	$IM_{M_{o.c}}$
National	Positional	0.760	0.392
North	Positional	0.824	0.341
	Hybrid	0.844	0.325
North West	Positional	0.877	0.298
	Hybrid	0.848	0.322
Center North	Positional	0.819	0.345
	Hybrid	0.827	0.339
Center	Positional	0.772	0.382
	Hybrid	0.781	0.375
South	Positional	0.814	0.349
	Hybrid	0.701	0.439

Note: Clustered standard errors in parentheses. Cluster unit is the primary sampling unit. Positional row corresponds to estimations based on regionally defined quintiles, while hybrid corresponds to the nationally defined quintiles. Sample weights employed. The North region consists of Baja California, Sonora, Chihuahua, Coahuila, Nuevo León and Tamaulipas; Northwest consists of Baja California Sur, Sinaloa, Nayarit, Durango and Zacatecas; the Center North region is form by Jalisco, Aguascalientes, Colima, Michoacán and San Luis Potosí; the Center region is formed by Guanajuato, Querétaro, Hidalgo, Estado de México, ; Mexico City, Morelos, Tlaxcala, and Puebla; the South region is formed by Guerrero, Oaxaca, Chiapas, Veracruz, Tabasco, Campeche, Yucatán and Quintana Roo. The corresponding transition matrices are presented in tables D1 to D10 of the appendix and they only consider individuals who remained in the same region they were when 14 years old.

exemption of the south region, the persistence at the top is higher than at the bottom for all other regions.

The comparison between the four panels of figure 2 highlights that the considerable persistence rate at the bottom of the south region's distribution of economic resources is not the fruit of a higher degree of positional immobility in that point of the distribution than in the rest of the country. In fact, the point estimate of positional mobility from the bottom for the south region is the second lowest in the country. This implies that the divergence of the south in terms of intergenerational economic mobility with respect to the rest of Mexico is associated with the lack of convergence of the region in terms of economic conditions. As Esquivel (1999); Sakikawa (2012) and German-Soto et al. (2020) show, convergence in terms of output stopped since the early 1980s. Consequently, most of the south region's sample has been exposed to this particular growth environment during most of their lives.

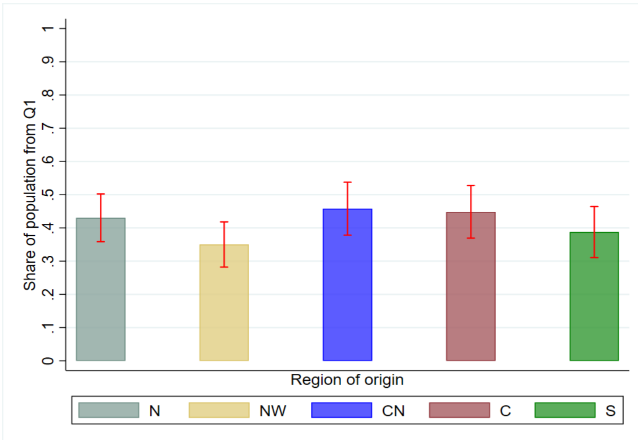
These results provide a more complex image of the Mexican regional landscape than the one produced by the existing literature. While Delajara et al. (2022) suggest that the south suffers a double burden (low intergenerational mobility and precarious economic conditions), my results show that, internally, the region has the same positional mobility rates as the rest of the country. Thus, it is not possible to assert that the region is by itself less mobile or more rigidly stratified than the other regions. This is in line with the evidence by Hausmann et al. (2021) that suggests that the causes of the precarious living conditions are in the aggregate performance of the region's economy and not in some characteristic of the region's society.

6 Final Remarks

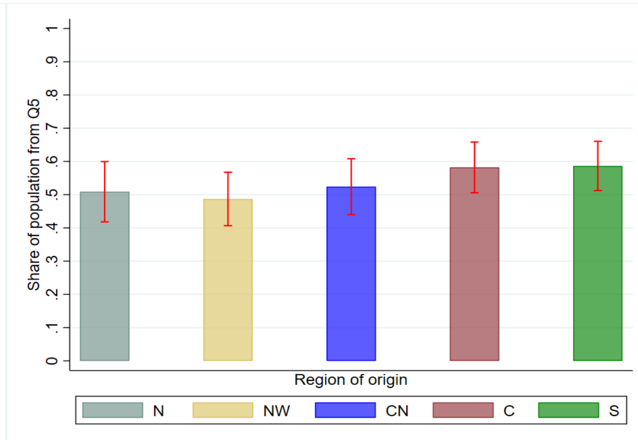
The existing literature on intranational differences in intergenerational social mobility shows that differences in social mobility exist not only between countries but also within them (Chetty et al., 2015; Heidrich, 2017; Connolly et al., 2019; Corak, 2019; Monroy-Gómez-Franco and Corak, 2019; Monroy-Gómez-Franco and Vélez-Grajales, 2021; Acciari et al., 2022; Delajara et al., 2022). The next phase in that research program is to understand that heterogeneity's determinants better. The first step in that direction, particularly relevant for cases in which intergenerational panel datasets are not existing, is decomposing the observed intergenerational mobility rates into their structural and positional components.

The decomposition of intergenerational mobility rates into the structural and positional components allows the identification of the major contributor to the persistence patterns. The structural component corresponds to the differences in aggregate dynamics of the intranational regions. In contrast, the positional component consists of the differences in the probability that the inhabitants of a region exchange positions in the distribution between two generations. Therefore, properly accruing the influence of each component is crucial not only to gain a better

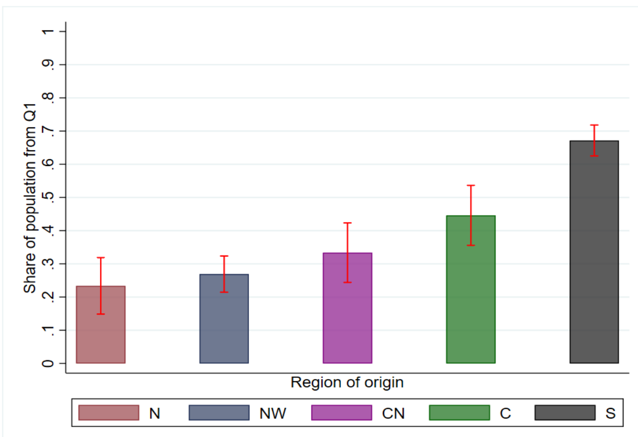
Figure 2. Persistence at the bottom and top quintiles of origin distribution



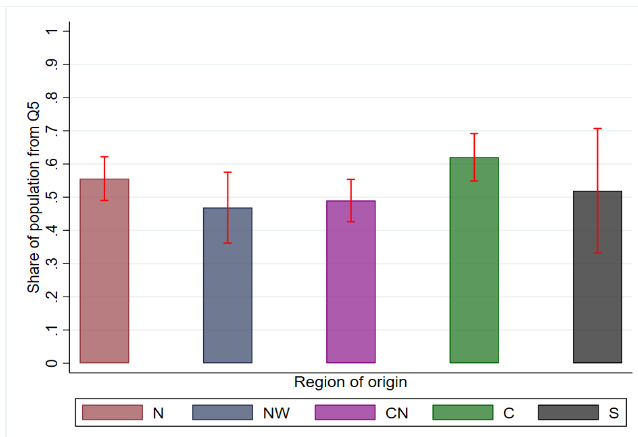
(a) Share of population with origin in the first quintile of the regional distribution.



(b) Share of population with origin in the fifth quintile of the regional distribution.



(c) Share of population with origin in the first quintile of the national distribution.



(d) Share of population with origin in the fifth quintile of the national distribution.

Note: Linearized standard errors shown in red. Sample weights employed. The persistence probabilities correspond to the sahre of the population with origin in quintile o who remained at the same quintile. The North region consists of Baja California, Sonora, Chihuahua, Coahuila, Nuevo León and Tamaulipas; North West consists of Baja California Sur, Sinaloa, Nayarit, Durango and Zacatecas; the Center North region is form by Jalisco, Aguascalientes, Colima, Michoacán and San Luis Potosí; the Center region is formed by Guanajuato, Querétaro, Hidalgo, Estado de México, ; Mexico City, Morelos, Tlaxcala, and Puebla; the South region is formed by Guerrero, Oaxaca, Chiapas, Veracruz, Tabasco, Campeche, Yucatán and Quintana Roo.

understanding of the phenomenon but also to design the most appropriate policies to increase intergenerational mobility in a country..

In this paper, I use the Mexican case to illustrate the relevance of this decomposition for interpreting the differences in mobility rates at the subnational level. My results show that the higher intergenerational persistence rate observed for the south region of the country, previously documented by the literature (Vélez-Grajales et al., 2018; Monroy-Gómez-Franco and Corak, 2019; Monroy-Gómez-Franco and Vélez-Grajales, 2021; Delajara et al., 2022) is a product of the large gap between the region and the rest of the country in terms of aggregate income. No significant differences are observed when estimating the positional mobility rate across Mexican regions. This implies that the results from the previous literature are primarily determined by the structural mobility component, whereas all the country's regions exhibit a similar rate of social fluidity.

The results of this paper shows the importance of decomposing the mobility rates in their structural and positional components, as it allows a better understanding of the main drivers of the intranational persistence patterns. This opens a new avenue of research in this area, as it allows the exploration of each component separately, and consequently, a finer analysis of the determinants of the mobility patterns. Similarly, it allows to tie the political economy and the positional preferences literatures with a more robust empirical approach for the analysis of the hypotheses of those literatures in the realm of intergenerational mobility.

The results of this paper show the importance of decomposing the mobility rates in their structural and positional components, as it allows a better understanding of the main drivers of the intranational persistence patterns. This opens a new avenue of research in this area, as it allows the exploration of each component separately and, consequently, a more nuanced analysis of the determinants of the mobility patterns. Similarly, it allows tying the political economy and the positional preferences literatures with a more robust empirical approach for analyzing the hypotheses of those literatures in intergenerational mobility.

However, several limitations of this paper are relevant to the literature as a whole. First, the limited regionalization of the database prevents a deeper analysis of the difference in positional mobility across the Mexican states. This is relevant for other countries, as the primary determinant of the regional representativeness of a survey is the sample size and design, while themselves being determined by the funding available for the survey. Secondly, although the use of retrospective data allows circumventing the lack of intergenerational panel datasets, it also limits the type of mobility being assessed. Using an index of economic resources allows to identify mobility patterns in a dimension conceptually similar to the permanent income of the observed unit, but it limits the comparability with other studies that rely on income data.

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A Regionalization of the sample

Table A1. Regional composition

Region	States
North	Baja California, Sonora, Chihuahua, Coahuila, Nuevo León and Tamaulipas
North West	Baja California Sur, Sinaloa, Nayarit, Durango and Zacatecas
Center North	Jalisco, Aguascalientes, Colima, Michoacán and San Luis Potosí
Center	Guanajuato, Querétaro, Hidalgo, Estado de México, Mexico City, Morelos, Tlaxcala, and Puebla
South	Guerrero, Oaxaca, Chiapas, Veracruz, Tabasco, Campeche, Yucatán and Quintana Roo

B Construction of the economic resources index

Table B1. Components of the origin household's economic resources index

Good/service	Value	Coordinates	Explained inertia
Overcrowded household	0	1.207	0.022
	1	-0.726	0.013
Access to potable water	0	-1.640	0.036
	1	0.812	0.018
Stove	0	-1.662	0.036
	1	0.816	0.018
Electricity	0	-2.233	0.027
	1	0.350	0.004
TV set	0	-1.589	0.027
	1	0.805	0.004
Refrigerator	0	-1.471	0.037
	1	0.805	0.028
Washing machine	0	-0.935	0.023
	1	1.905	0.028
Landline	0	-0.710	0.016
	1	2.415	0.053
Computer	0	-0.178	0.016
	1	2.415	0.053
WC in house premises	0	-1.443	0.035
	1	1.025	0.025
Toaster	0	-0.264	0.003
	1	3.598	0.035
Domestic service	0	-0.199	0.001
	1	2.631	0.019
Videogame console	0	-0.244	0.002
	1	3.317	0.030

Good/service	Value	Coordinates	E
VHS/DVD player	0	-0.595	
	1	2.344	
Microwave	0	-0.322	
	1	3.135	
Cable TV	0	-0.260	
	1	2.976	
Owners of another dwelling	0	-0.094	
	1	2.368	
Owners of commercial venue	0	-0.123	
	1	2.266	
Automobile	0	-0.573	
	1	2.080	
Bank account	0	-0.213	
	1	3.309	
Credit Card	0	-0.236	
	1	3.569	
Water heater	0	-0.909	
	1	1.749	
Owners of inhabited dwelling	0	-0.189	
	1	0.053	
Non-dirt house floor	0	-1.905	
	1	0.576	
Vacuum	0	-0.168	
	1	4.229	

Table B2. Components of the current household's economic resources index

Good/service	Value	Coordinates	Explained inertia	Good/service	Value	Coordinates	E
Overcrowded household	0	0.375	0.004	VHS/DVD player	0	-1.082	
	1	-1.101	0.011		1	1.356	
Access to potable water	0	-2.308	0.018	Microwave	0	-1.434	
	1	0.246	0.002		1	1.442	
Stove	0	-2.932	0.019	Cable TV	0	-1.157	
	1	0.200	0.001		1	1.185	
Electricity	0	-1.837	0.001	Owners of another dwelling	0	-0.118	
	1	0.012	0.000		1	2.513	
Tractor	0	-0.010	0.001	Owners of commercial venue	0	-0.098	
	1	0.927	0.001		1	1.897	
Refrigerator	0	-2.726	0.024	Owner of agricultural lands	0	-0.134	
	1	0.286	0.003		1	1.460	
Washing machine	0	-2.186	0.038	Bank account	0	-0.577	
	1	0.649	0.011		1	2.110	
Landline	0	-1.069	0.024	Credit Card	0	-0.503	
	1	1.733	0.040		1	2.546	
Computer	0	-1.004	0.024	Water heater	0	-1.305	
	1	2.109	0.049		1	1.029	
Internet access	0	-1.285	0.033	Owners of inhabited dwelling	0	-0.395	
	1	1.824	0.047		1	0.078	
Toaster	0	-0.623	0.011	Dirt house floor	0	0.066	
	1	2.497	0.043		1	-2.496	
Domestic service	0	-0.247	0.002	Vacuum	0	-0.429	
	1	2.135	0.016		1	3.003	
Automobile	0	-1.125	0.023	Tablet	0	-0.686	
	1	1.276	0.026		1	2.445	
Videogame console	0	-0.244	0.002	Cellphone	0	-2.183	
	1	3.317	0.030		1	0.349	

C Regression tables

Table C1. Rank-Rank regressions
(Ranks defined over the national distribution, 50 quantiles)

Region	North	North-west	Center-north	Center	South
Rank of origin	0.507	0.431	0.495	0.609	0.633
	(0.0237)	(0.0330)	(0.0260)	(0.0286)	(0.0295)
Intercept	14.70	15.63	13.04	11.52	5.977
	(0.984)	(1.113)	(0.767)	(1.081)	(0.588)
Observations	1,830	1,355	1,886	3,403	2,616
R-squared	0.269	0.200	0.303	0.345	0.412

Notes: Clustered standard errors. Sample weights employed. Ranks correspond to 50 quantiles of the corresponding national distribution. The North region consists of Baja California, Sonora, Chihuahua, Coahuila, Nuevo León and Tamaulipas; North West consists of Baja California Sur, Sinaloa, Nayarit, Durango and Zacatecas; the Center North region is form by Jalisco, Aguascalientes, Colima, Michoacán and San Luis Potosí; the Center region is formed by Guanajuato, Querétaro, Hidalgo, Estado de México, Mexico City, Morelos, Tlaxcala, and Puebla; the South region is formed by Guerrero, Oaxaca, Chiapas, Veracruz, Tabasco, Campeche, Yucatán and Quintana Roo. The regressions only consider individuals who remained in the same region they were when 14 years old.

Table C2. Rank-Rank regressions
(Ranks defined over the national distribution, 20 quantiles)

Region	North	North-west	Center-north	Center	South
Rank of origin	0.508	0.433	0.497	0.613	0.639
	(0.0229)	(0.0354)	(0.0260)	(0.0278)	(0.0303)
Constant	6.011	6.373	5.348	4.654	2.421
	(0.388)	(0.470)	(0.315)	(0.431)	(0.243)
Observations	1,830	1,355	1,886	3,403	2,616
R-squared	0.270	0.200	0.302	0.347	0.410

Notes: Clustered standard errors. Sample weights employed. Ranks correspond to 20 quantiles of the corresponding national distribution. The North region consists of Baja California, Sonora, Chihuahua, Coahuila, Nuevo León and Tamaulipas; North West consists of Baja California Sur, Sinaloa, Nayarit, Durango and Zacatecas; the Center North region is form by Jalisco, Aguascalientes, Colima, Michoacán and San Luis Potosí; the Center region is formed by Guanajuato, Querétaro, Hidalgo, Estado de México, Mexico City, Morelos, Tlaxcala, and Puebla; the South region is formed by Guerrero, Oaxaca, Chiapas, Veracruz, Tabasco, Campeche, Yucatán and Quintana Roo. The regressions only consider individuals who remained in the same region they were when 14 years old.

Table C3. Rank-Rank regressions
(Ranks defined over the national distribution, 10 quantiles)

Region	North	North-west	Center-north	Center	South
Rank of origin 0.502	0.432	0.496	0.608	0.644	
	(0.0223)	(0.0363)	(0.0266)	(0.0298)	(0.0304)
Constant	3.169	3.335	2.811	2.450	1.286
	(0.199)	(0.237)	(0.170)	(0.230)	(0.127)
Observations	1,830	1,355	1,886	3,403	2,616
R-squared	0.261	0.197	0.297	0.342	0.408

Notes: Clustered standard errors. Sample weights employed. Ranks correspond to 10 quantiles of the corresponding national distribution. The North region consists of Baja California, Sonora, Chihuahua, Coahuila, Nuevo León and Tamaulipas; North West consists of Baja California Sur, Sinaloa, Nayarit, Durango and Zacatecas; the Center North region is form by Jalisco, Aguascalientes, Colima, Michoacán and San Luis Potosí; the Center region is formed by Guanajuato, Querétaro, Hidalgo, Estado de México, Mexico City, Morelos, Tlaxcala, and Puebla; the South region is formed by Guerrero, Oaxaca, Chiapas, Veracruz, Tabasco, Campeche, Yucatán and Quintana Roo. The regressions only consider individuals who remained in the same region they were when 14 years old.

Table C4. Rank-Rank regressions
(Ranks defined over the regional distributions, 50 quantiles)

Region	North	North-west	Center-north	Center	South
Rank of origin 0.507	0.416	0.512	0.564	0.559	
	(0.0266)	(0.0285)	(0.0274)	(0.0290)	(0.0263)
Constant	1.481	1.748	1.465	1.307	1.328
	(0.109)	(0.129)	(0.0842)	(0.110)	(0.108)
Observations	1,830	1,355	1,886	3,403	2,616
R-squared	0.257	0.173	0.262	0.317	0.314

Notes: Clustered standard errors. Sample weights employed. Ranks correspond to 50 quantiles of the corresponding regional distribution. The North region consists of Baja California, Sonora, Chihuahua, Coahuila, Nuevo León and Tamaulipas; North West consists of Baja California Sur, Sinaloa, Nayarit, Durango and Zacatecas; the Center North region is form by Jalisco, Aguascalientes, Colima, Michoacán and San Luis Potosí; the Center region is formed by Guanajuato, Querétaro, Hidalgo, Estado de México, Mexico City, Morelos, Tlaxcala, and Puebla; the South region is formed by Guerrero, Oaxaca, Chiapas, Veracruz, Tabasco, Campeche, Yucatán and Quintana Roo. The regressions only consider individuals who remained in the same region they were when 14 years old.

Table C5. Rank-Rank regressions
(Ranks defined over the regional distributions, 20 quantiles)

Region	North	North-west	Center-north	Center	South
Rank of origin	0.534	0.435	0.555	0.594	0.533
	(0.0254)	(0.0318)	(0.0257)	(0.0292)	(0.0249)
Constant	4.899	5.937	4.669	4.275	5.101
	(0.390)	(0.498)	(0.296)	(0.398)	(0.377)
Observations	1,830	1,355	1,886	3,403	2,616
R-squared	0.286	0.192	0.308	0.355	0.326

Notes: Clustered standard errors. Sample weights employed. Ranks correspond to 20 quantiles of the corresponding regional distribution. The North region consists of Baja California, Sonora, Chihuahua, Coahuila, Nuevo León and Tamaulipas; North West consists of Baja California Sur, Sinaloa, Nayarit, Durango and Zacatecas; the Center North region is form by Jalisco, Aguascalientes, Colima, Michoacán and San Luis Potosí; the Center region is formed by Guanajuato, Querétaro, Hidalgo, Estado de México, Mexico City, Morelos, Tlaxcala, and Puebla; the South region is formed by Guerrero, Oaxaca, Chiapas, Veracruz, Tabasco, Campeche, Yucatán and Quintana Roo. The regressions only consider individuals who remained in the same region they were when 14 years old.

Table C6. Rank-Rank regressions
(Ranks defined over the regional distributions, 10 quantiles)

Region	North	North-west	Center-north	Center	South
Rank of origin 0.537	0.433	0.544	0.591	0.547	
	(0.0260)	(0.0312)	(0.0269)	(0.0292)	(0.0252)
Constant	2.546	3.121	2.507	2.250	2.563
	(0.202)	(0.255)	(0.165)	(0.203)	(0.201)
Observations	1,830	1,355	1,886	3,403	2,616
R-squared	0.287	0.190	0.297	0.349	0.326

Notes: Clustered standard errors. Sample weights employed. Ranks correspond to 10 quantiles of the corresponding regional distribution. The North region consists of Baja California, Sonora, Chihuahua, Coahuila, Nuevo León and Tamaulipas; North West consists of Baja California Sur, Sinaloa, Nayarit, Durango and Zacatecas; the Center North region is form by Jalisco, Aguascalientes, Colima, Michoacán and San Luis Potosí; the Center region is formed by Guanajuato, Querétaro, Hidalgo, Estado de México, Mexico City, Morelos, Tlaxcala, and Puebla; the South region is formed by Guerrero, Oaxaca, Chiapas, Veracruz, Tabasco, Campeche, Yucatán and Quintana Roo. The regressions only consider individuals who remained in the same region they were when 14 years old.

D Transition matrices

D.1 Transition matrices, Nationally defined quantiles

Table D1. North region transition matrix
(Quintiles defined over the national distribution)

	Q1 (Bottom)	Q2	Q3	Q4	Q5 (Top)
Q1 (Bottom)	0.234 (0.044)	0.322 (0.039)	0.264 (0.038)	0.117 (0.020)	0.064 (0.023)
Q2	0.202 (0.031)	0.237 (0.041)	0.224 (0.025)	0.231 (0.035)	0.106 (0.017)
Q3	0.127 (0.022)	0.249 (0.024)	0.270 (0.024)	0.203 (0.016)	0.151 (0.026)
Q4	0.032 (0.010)	0.144 (0.024)	0.253 (0.034)	0.327 (0.020)	0.244 (0.036)
Q5 (Top)	0.005 (0.002)	0.031 (0.009)	0.123 (0.019)	0.284 (0.024)	0.556 (0.033)

Note: Rows correspond to the origin quantile, columns to current quintile. Sample weights employed. The North (N) region consists of Baja California, Sonora, Chihuahua, Coahuila, Nuevo León and Tamaulipas. Quintiles defined over the national distribution.

Table D2. Northwest region transition matrix
(Quintiles defined over the national distribution)

	Q1 (Bottom)	Q2	Q3	Q4	Q5 (Top)
Q1 (Bottom)	0.269	0.336	0.223	0.121	0.050
	(0.028)	(0.032)	(0.030)	(0.026)	(0.020)
Q2	0.182	0.320	0.247	0.171	0.080
	(0.030)	(0.024)	(0.044)	(0.036)	(0.023)
Q3	0.111	0.290	0.265	0.224	0.111
	(0.020)	(0.026)	(0.028)	(0.031)	(0.023)
Q4	0.015	0.155	0.252	0.286	0.291
	(0.010)	(0.032)	(0.045)	(0.050)	(0.040)
Q5 (Top)	0.068	0.079	0.179	0.206	0.469
	(0.028)	(0.020)	(0.034)	(0.028)	(0.055)

Note: Rows correspond to the origin quantile, columns to current quintile. Sample weights employed. Clustered standard errors. Cluster unit is the primary sampling unit. North West (NW) consists of Baja California Sur, Sinaloa, Nayarit, Durango and Zacatecas. Quintiles defined over the national distribution.

Table D3. Center-north region transition matrix
(Quintiles defined over the national distribution)

	Q1 (Bottom)	Q2	Q3	Q4	Q5 (Top)
Q1 (Bottom)	0.334	0.322	0.270	0.258	0.104
	(0.046)	(0.039)	(0.033)	(0.031)	(0.030)
Q2	0.188	0.358	0.288	0.114	0.052
	(0.028)	(0.032)	(0.036)	(0.028)	(0.016)
Q3	0.077	0.355	0.264	0.228	0.076
	(0.020)	(0.033)	(0.031)	(0.027)	(0.014)
Q4	0.025	0.180	0.385	0.248	0.161
	(0.009)	(0.021)	(0.034)	(0.027)	(0.027)
Q5 (Top)	0.016	0.047	0.180	0.278	0.490
	(0.003)	(0.010)	(0.027)	(0.019)	(0.033)

Note: Rows correspond to the origin quantile, columns to current quintile. Sample weights employed. Clustered standard errors. Cluster unit is the primary sampling unit. Center North (CN) region is form by Jalisco, Aguascalientes, Colima, Michoacán and San Luis Potosí. Quintiles defined over the national distribution.

Table D4. Center region transition matrix
(Quintiles defined over the national distribution)

	Q1 (Bottom)	Q2	Q3	Q4	Q5 (Top)
Q1 (Bottom)	0.446	0.273	0.180	0.070	0.032
	(0.046)	(0.045)	(0.030)	(0.018)	(0.016)
Q2	0.243	0.220	0.258	0.158	0.121
	(0.032)	(0.023)	(0.050)	(0.030)	(0.022)
Q3	0.156	0.225	0.244	0.249	0.126
	(0.039)	(0.025)	(0.026)	(0.036)	(0.022)
Q4	0.047	0.134	0.225	0.345	0.249
	(0.017)	(0.022)	(0.021)	(0.033)	(0.025)
Q5 (Top)	0.016	0.032	0.070	0.261	0.620
	(0.006)	(0.008)	(0.015)	(0.030)	(0.037)

Note: Rows correspond to the origin quantile, columns to current quintile. Sample weights employed. Clustered standard errors. Cluster unit is the primary sampling unit. Center region is formed by Guanajuato, Querétaro, Hidalgo, Estado de México, Mexico City, Morelos, Tlaxcala, and Puebla. Quintiles defined over the national distribution.

Table D5. South region transition matrix
(Quintiles defined over the national distribution)

	Q1 (Bottom)	Q2	Q3	Q4	Q5 (Top)
Q1 (Bottom)	0.672 (0.024)	0.218 (0.018)	0.078 (0.012)	0.027 (0.006)	0.006 (0.003)
Q2	0.434 (0.044)	0.341 (0.032)	0.135 (0.018)	0.058 (0.012)	0.031 (0.011)
Q3	0.143 (0.022)	0.348 (0.034)	0.291 (0.033)	0.188 (0.033)	0.030 (0.008)
Q4	0.095 (0.040)	0.189 (0.031)	0.194 (0.026)	0.371 (0.038)	0.150 (0.024)
Q5 (Top)	0.026 (0.017)	0.062 (0.067)	0.194 (0.057)	0.198 (0.052)	0.519 (0.096)

Note: Rows correspond to the origin quantile, columns to current quintile. Sample weights employed. Clustered standard errors. Cluster unit is the primary sampling unit. The South region is formed by Guerrero, Oaxaca, Chiapas, Veracruz, Tabasco, Campeche, Yucatán and Quintana Roo. Quintiles defined over the national distribution.

D.2 Transition matrices, regionally defined quantiles

Table D6. North region transition matrix
(Quintiles defined over the regional distribution)

	Q1 (Bottom)	Q2	Q3	Q4	Q5 (Top)
Q1 (Bottom)	0.430	0.246	0.160	0.102	0.062
	(0.037)	(0.028)	(0.025)	(0.021)	(0.014)
Q2	0.313	0.242	0.222	0.161	0.062
	(0.025)	(0.024)	(0.026)	(0.025)	(0.019)
Q3	0.127	0.233	0.247	0.186	0.163
	(0.027)	(0.032)	(0.019)	(0.021)	(0.039)
Q4	0.072	0.193	0.251	0.277	0.206
	(0.016)	(0.028)	(0.021)	(0.030)	(0.028)
Q5 (Top)	0.013	0.082	0.121	0.275	0.509
	(0.005)	(0.019)	(0.026)	(0.027)	(0.047)

Note: Rows correspond to the origin quantile, columns to current quintile. Sample weights employed. The North (N) region consists of Baja California, Sonora, Chihuahua, Coahuila, Nuevo León and Tamaulipas. Quintiles defined over the regional distribution.

Table D7. Northwest region transition matrix
(Quintiles defined over the regional distribution)

	Q1 (Bottom)	Q2	Q3	Q4	Q5 (Top)
Q1 (Bottom)	0.350 (0.035)	0.263 (0.019)	0.198 (0.028)	0.133 (0.029)	0.055 (0.022)
Q2	0.284 (0.038)	0.226 (0.027)	0.185 (0.037)	0.206 (0.038)	0.099 (0.028)
Q3	0.214 (0.028)	0.254 (0.034)	0.206 (0.028)	0.211 (0.027)	0.116 (027)
Q4	0.095 (0.019)	0.179 (0.027)	0.266 (0.043)	0.223 (0.024)	0.237 (0.033)
Q5 (Top)	0.067 (0.019)	0.068 (0.019)	0.150 (0.025)	0.229 (0.025)	0.487 (0.041)

Note: Rows correspond to the origin quantile, columns to current quintile. Sample weights employed. Clustered standard errors. Cluster unit is the primary sampling unit. North West (NW) consists of Baja California Sur, Sinaloa, Nayarit, Durango and Zacatecas. Quintiles defined over the regional distribution.

Table D8. Center-north region transition matrix
(Quintiles defined over the regional distribution)

	Q1 (Bottom)	Q2	Q3	Q4	Q5 (Top)
Q1 (Bottom)	0.458 (0.041)	0.233 (0.030)	0.168 (0.027)	0.100 (0.023)	0.041 (0.014)
Q2	0.262 (0.030)	0.263 (0.031)	0.218 (0.029)	0.169 (0.024)	0.088 (0.016)
Q3	0.148 (0.026)	0.272 (0.034)	0.250 (0.036)	0.228 (0.025)	0.102 (0.018)
Q4	0.101 (0.022)	0.167 (0.033)	0.257 (0.049)	0.230 (0.026)	0.246 (0.041)
Q5 (Top)	0.029 (0.010)	0.069 (0.019)	0.105 (0.025)	0.272 (0.025)	0.524 (0.043)

Note: Rows correspond to the origin quantile, columns to current quintile. Sample weights employed. Clustered standard errors. Cluster unit is the primary sampling unit. Center North (CN) region is form by Jalisco, Aguascalientes, Colima, Michoacán and San Luis Potosí. Quintiles defined over the regional distribution.

Table D9. Center region transition matrix
(Quintiles defined over the regional distribution)

	Q1 (Bottom)	Q2	Q3	Q4	Q5 (Top)
Q1 (Bottom)	0.448	0.282	0.167	0.065	0.049
	(0.041)	(0.037)	(0.016)	(0.014)	(0.017)
Q2	0.294	0.291	0.222	0.129	0.064
	(0.037)	(0.038)	(0.027)	(0.032)	(0.016)
Q3	0.172	0.211	0.246	0.246	0.125
	(0.041)	(0.024)	(0.024)	(0.039)	(0.019)
Q4	0.068	0.170	0.235	0.343	0.184
	(0.015)	(0.026)	(0.021)	(0.026)	(0.023)
Q5 (Top)	0.018	0.049	0.134	0.216	0.582
	(0.007)	(0.017)	(0.017)	(0.026)	(0.039)

Note: Rows correspond to the origin quantile, columns to current quintile. Sample weights employed. Clustered standard errors. Cluster unit is the primary sampling unit. Center region is formed by Guanajuato, Querétaro, Hidalgo, Estado de México, Mexico City, Morelos, Tlaxcala, and Puebla. Quintiles defined over the regional distribution.

Table D10. South region transition matrix
(Quintiles defined over the regional distribution)

	Q1 (Bottom)	Q2	Q3	Q4	Q5 (Top)
Q1 (Bottom)	0.387	0.300	0.146	0.132	0.035
	(0.040)	(0.028)	(0.021)	(0.240)	(0.010)
Q2	0.344	0.246	0.238	0.124	0.048
	(0.039)	(0.027)	(0.035)	(0.016)	(0.011)
Q3	0.182	0.260	0.236	0.210	0.113
	(0.037)	(0.028)	(0.027)	(0.026)	(0.019)
Q4	0.069	0.150	0.265	0.290	0.226
	(0.015)	(0.023)	(0.027)	(0.025)	(0.027)
Q5 (Top)	0.015	0.040	0.112	0.246	0.586
	(0.007)	(0.012)	(0.016)	(0.030)	(0.038)

Note: Rows correspond to the origin quantile, columns to current quintile. Sample weights employed. Clustered standard errors. Cluster unit is the primary sampling unit. The South region is formed by Guerrero, Oaxaca, Chiapas, Veracruz, Tabasco, Campeche, Yucatán and Quintana Roo. Quintiles defined over the regional distribution.