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Unequal Gradients: Sex, Skin Tone and Intergenerational Economic Mobility*

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Abstract

We study how the intersection between skin tone and sex shapes intergenerational mobility of economic resources in Mexico. Using two recent social mobility surveys, we estimate the rank persistence and transition matrices by sex combined with skin tone groups. First, we find no differences in intergenerational mobility patterns between light-skin men and women. Second, the colorist mobility pattern observed in previous literature affects men and women differently. Namely, while women of intermediate and dark-skin tonalities have a lower expected rank than their light-skin peers, only men of the darkest tonalities suffer from the same penalization. Thirdly, women of intermediate and darker skin tones have lower persistence rates at the top of the distribution of economic resources than men of the same skin tonality.

Keywords: Stratification economics, Intergenerational mobility, Skin tone, Gender inequality, Mexico
JEL: J16, J62, O15, Z13

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1. Introduction

Recent years have witnessed a growing interest among economists in differences in intergenerational mobility patterns across social groups. The relevant social groups are defined by different combinations of immutable characteristics that societies construct as markers upon which differences in the distribution of economic resources are to occur (Darity Jr., 2022). Although mobility differences associated with sex and racial origin or skin tone have been thoroughly analyzed separately, we cannot say the same about the mobility implications of their intersection.

Most of the existing literature on how the intersection between these two stratification axes produces differences in intergenerational mobility has focused on the US. For example, Jácome et al. (2021) estimate the long-run mobility patterns of the US population in the XXth century, disaggregating by sex and racial origin. They find that, for cohorts born between 1910 and 1950, the black population reduced the gap in average income with respect to the white population, which led to a fall in intergenerational persistence. However, even after these gains, black women remained at the bottom of the rank distribution. These patterns reversed for the younger cohorts, leading to a U-shaped pattern in the aggregate intergenerational income elasticity and an L-shaped pattern in rank persistence. This result implies that black Americans remained at the bottom of the distribution of economic resources and experienced a high intergenerational rank persistence rate; namely, positions between one generation and the next are highly correlated, albeit less than at the beginning of that century. Moreover, this result is also observed among cohorts born in the last quarter of the XXth century (Lee and Sun, 2020; Nguyen et al., 2005).

Other studies analyze the intersection between national origin and gender for the US case. For example, Chen et al. (2007) find that daughters of migrants are more mobile than sons. They posit that this happens paradoxically because migrants' daughters face adverse discrimination in the labor market and within their households. Similarly, Choi et al. (2020) analyze the role of status and marriage sorting as determinants of intergenerational social mobility in the US and argue that they should be studied separately. They find that marriage plays a mediating role in women's intergenerational transmission (until they reach their thirties), mainly among the younger cohorts. They also find that marriage sorting is more important than status among these cohorts. Flake (2013) studies the same intersection of gradients in Germany, finding that migrant women are more mobile than migrant men.

Among developing countries, research on the mobility implications of intersecting stratification by skin stone and sex is scarcer. In India, Emran et al. (2021) found a relationship between the type of community of origin and differences associated with sex in educational mobility. In rural communities, they found that women experience less absolute mobility than their male peers, while

no such gap exists in urban communities. Similarly, Asher et al. (2021) analyze the differences in mobility patterns between the subaltern groups of Indian society (Muslims, Scheduled Castes, and Scheduled Tribes) and sex. They find that in the last half of the XXth century, men from the Scheduled Castes and Tribes closed the gap in upward educational mobility with respect to their peers from non-disadvantaged groups. However, the same has not occurred for Muslims nor women from the other subaltern groups. Focusing on the other extreme, on the upper castes, Azam (2016) finds that daughters from these groups have a higher probability of experiencing upward educational mobility, even after controlling for the father's/mother's education. Duryea et al. (2019) compare educational mobility by gender and race among students in a Brazilian public university (Pernambuco). They show that persistence at the top of the social ladder and upward mobility from the lower end is higher for men than for women. Moreover, they find the same pattern for the white population compared to the Afro-Brazilians.

The Mexican case is no exemption to this general pattern. Recent studies have found a colorist gradient in intergenerational economic rank mobility. Light-skin persons tend to start at a higher position in the distribution of economic resources. They are more likely to persist at that segment of the distribution when reaching adulthood than the rest of the population, particularly those with the darkest skin tones and indigenous origins (Campos-Vázquez and Medina-Cortina, 2019; Monroy-Gómez-Franco and Vélez-Grajales, 2021; Monroy-Gómez-Franco, Forthcoming). Similarly, recent research on sex differences in intergenerational mobility has established that women with origin at the bottom of the social ladder experience higher persistence rates than men. In contrast, women who start at the top of the distribution have a higher chance of falling down the distribution of economic resources than their male peers Torche (2015, 2019). For the Mexican case, there is still no social mobility analysis of the intersection between sex and skin. However, previous research on the effects of colorism on labor market outcomes suggests that women with dark and medium skin tones women suffer a larger penalization than their male peers. (Arceo-Gómez and Campos-Vázquez, 2014, 2019)[4]. Our paper fills this gap in the literature.

We study how the intersection between skin tone and sex shapes intergenerational social mobility of economic resources in Mexico. Combining two recent social mobility surveys, we estimate models of rank persistence and transition matrices by combinations of sex and skin tone for an index of household economic resources. As an added novelty, we also condition the analysis by type of arrangement in the respondents' household of origin (at 14 years of age).

[4]Similarly, Krozer and Urrutia-Gómez (2021) provide qualitative evidence of the role of concerns regarding one's skin tone among women.

We can summarize our main findings as follows. First, we find no evidence of differences in intergenerational mobility patterns between light-skin men and women. This result suggests no sex stratification in economic mobility among light-skinned Mexicans. Second, the colorist mobility pattern observed in previous literature affects men and women differently. For instance, while women of intermediate and dark-skin tonalities have a lower expected rank than their light- skin peers (starting from the same rank of origin), only men of the darkest tonalities suffer the same penalization. Thirdly, women of intermediate and darker skin tones have significantly lower persistence rates at the top of the distribution of economic resources than men of the same skin tonality.

In the next section, we describe the dataset we employ for our analysis.

2. Data

We rely on the MMSI 2016/ESRU-EMOVI 2017 composite dataset, already used by Delajara et al. (2022) and described in detail by Monroy-Gómez-Franco (Forthcoming). This composite dataset comprises pooled observations from two retrospective surveys designed for the study of social mobility in Mexico: the Intergenerational Social Mobility Module of 2016 (MMSI-2016), fielded by the national statistics office (INEGI), and the ESRU Survey on Social Mobility in Mexico of 2017 (ESRU-EMOVI 2017), fielded by the *Centro de Estudios Espinosa Yglesias*. The two surveys have the same target population (non-institutionalized Mexican men and women between 25 and 64 years old),[5] the same reference point for the retrospective questions (14 years of age of the respondent), the same sample design, the same basic questionnaire, and the same measurement instrument for skin tone.

This latter aspect is crucial for our research. Both surveys rely on self-identification of skin tone based on comparing the respondent's skin tone and the PERLA tone palette. The latter was developed by Telles, ed (2014) as part of the Project on Ethnicity and Race in Latin America (PERLA) and has been used in previous studies on social mobility and skin tone in Mexico, such as Flores and Telles (2012); Martínez Casas et al. (2014); Campos-Vázquez and Medina-Cortina (2018, 2019); Monroy-Gómez-Franco and Vélez-Grajales (2021); Monroy-Gómez-Franco (Forthcoming), and Woo-Mora (2022). In addition, Campbell et al. (2020) show that this palette provides a distribution of skin tones consistent with those obtained using colorimeters.

Also crucial to our research, both surveys interview adult men and women regardless of their household head status. For the Mexican case, this is crucial to analyze the mobility patterns of all

[5]This implies that the survey respondents include household heads and other members. The latter is particularly the case for women in Mexico, who are less likely to be household heads, as shown in Table 1.

women. Female labor force participation in the country was below 50% until very recently (López-Acevedo et al., 2020). As household head status is heavily correlated with participation in the labor market, a sampling frame that focuses exclusively on interviewing household heads would produce a sample with a majority of men and few working women, excluding by design the large segment of women who do not participate in the labor market[6]. The surveys employed overcome this limitation by interviewing both household heads and non-household heads of both sexes.

Both surveys also collect information regarding household living arrangements when the informant was 14 years old and their current household arrangement. This information enables the exploration of differences in the mobility patterns associated with the interaction of the arrangement of the household of origin and the respondent's sex. In addition, it allows us to analyze the relationship between the mobility pattern and the presence of a partner in the current household.

Table 1 presents the descriptive statistics. We restrict our sample to observations that have information regarding the identity of the household head in the origin household, leaving us with 37,259 observations in the sample out of 43,299 initially present in the pooling of both surveys. Column 2 shows the characteristics of the total sample, while the others show the characteristics of each of the subgroups defined by the origin household arrangement. We consider four possible arrangements: households in which only one parent was present (single mother, single father) and cases in which both parents were present, and the head was either the father or the mother.

As table 1 shows, most respondents lived in a household with a male household head (82% of the total; penultimate row, columns four plus five) when they were 14 years old. In addition, the predominant arrangement was a two-parent family with a paternal household head (78%). In this type of household, the father was more likely to have more years of education than the mother. By contrast, the reverse was true in female-headed households. Similarly, most of those who report having lived in a household with both parents headed by the mother are women, contrasting with the rest of the household arrangements that are more balanced in their respondents' sex composition. Besides these differences, the different household arrangements have a similar distribution in the other variables considered. Of particular interest for our analysis, the skin tone composition of the respondents is balanced across the different groups defined by household arrangement.

Figure 1 shows the distribution of skin tones by sex of the respondent. Both distributions are similar in the extremes, meaning that roughly 10% of men and women (self-)declare having the lightest skin tones, while a similar proportion declares the darkest ones. However, there are differences in

[6]Indeed, this is the case of the version of the ESRU Survey on Social Mobility in Mexico of 2006.

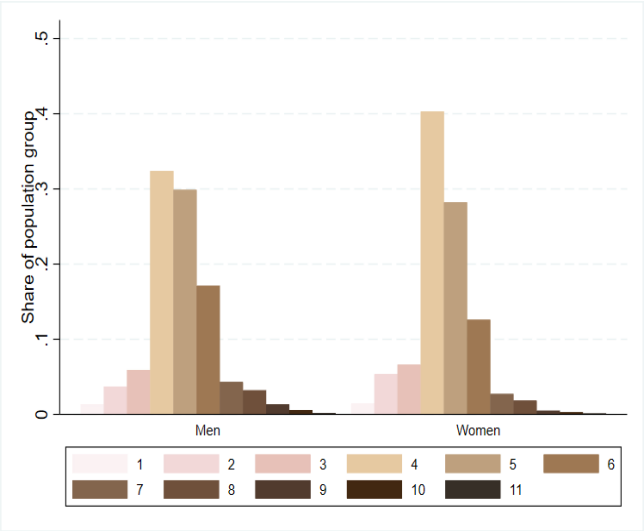
Table 1. Descriptive statistics

Variable	Full sample	Single mother	Single father	Dual parent, male hh	Dual parent, female hh
Female respondents	0.53 (0.003)	0.54 (0.010)	0.47 (0.022)	0.52 (0.004)	0.61 (0.017)
Current community is urban	0.83 (0.010)	0.88 (0.010)	0.84 (0.027)	0.82 (0.010)	0.87 (0.013)
Community of origin is urban	0.59 (0.013)	0.66 (0.146)	0.62 (0.037)	0.57 (0.014)	0.61 (0.019)
Respondent's years of education	9.88 (0.061)	9.99 (0.109)	9.14 (0.235)	9.99 (0.066)	10.32 (0.163)
Mother's years of education	4.69 (0.061)	5.22 (0.118)	–	4.52 (0.064)	6.033 (0.196)
Father's years of education	5.01 (0.065)	–	4.51 (0.247)	5.05 (0.067)	4.39 (0.161)
Light skin population	0.12 (0.005)	0.12 (0.007)	0.13 (0.016)	0.13 (0.005)	0.10 (0.011)
Medium skin population	0.80 (0.003)	0.81 (0.009)	0.80 (0.023)	0.80 (0.005)	0.83 (0.013)
Dark skin population	0.07 (0.003)	0.07 (0.007)	0.07 (0.013)	0.07 (0.002)	0.07 (0.009)
Indigenous population	0.13 (0.006)	0.10 (0.008)	0.15 (0.018))	0.13 (0.007)	0.15 (0.015)
Share of population	1	0.14 (0.003)	0.04 (0.003)	0.78 (0.004)	0.04 (0.002)
Sample size	37,259	4,873	1,126	27,711	1,618

Notes: Sample weights employed. Standard errors clustered at the primary sampling unit. The column of single mother (respectively father) households corresponds to the sample of respondents whose origin household was headed by a single mother (respectively father). The columns of dual-parent households correspond to the sample of respondents whose origin household had both parents present, varying the primary economic support (household head, hh) by sex. Communities with more than 2500 inhabitants are categorized as urban, both for the origin and the current household. The population with at least one parent who spoke an indigenous tongue is considered the indigenous population. Light skin tone corresponds to the population that declares to have a skin tone corresponding to tones 1-3 of the PERLA scale; medium skin tone corresponds to the population that declares a skin tone corresponding to tones 4-6 of the PERLA scale and dark skin tone corresponds to the population that declares a skin tone corresponding to tones 7-11 of the PERLA scale.

the intermediate tonalities, as a larger proportion of women declare having a lighter intermediate tonality, ten percentage points higher than men. Following Campos-Vázquez and Medina-Cortina (2019) and Monroy-Gómez-Franco and Vélez-Grajales (2021), we collapse the full PERLA scale into

Figure 1. Distribution of skin tones by sex



Note: Sample weights employed. Data from the MMSI 2016/ESRU-EMOVI 2017 composite sample. The numbers represent the tone number in the PERLA scale.

three tonality groups: light skin corresponds to the tones 1-3, medium tone to tones 4-6, and dark skin tone to 7-11 tones of the PERLA scale. Although this diminishes the variability in the skin tonalities of the population, it allows us to increase the sample size for each group and provide more precise mobility estimates.

We measure intergenerational economic mobility of an index of household resources aggregating information on durable goods, services, and assets owned by the current and origin households through Multiple Correspondence Analysis (MCA). Proposed by Monroy-Gómez-Franco (Forthcoming) the index uses the ownership profiles implicit in the respondents' answers to the questions regarding which goods and services they had in their origin household, or have in their current household, respectively, to derive a latent measure of economic resources in the household. The choice of MCA is suitable for the binary responses regarding ownership or service access, which are available in the survey. Besides Monroy-Gómez-Franco (Forthcoming), this methodological approach has been used for the study of social mobility patterns in Monroy-Gómez-Franco and Vélez-Grajales (2021); Monroy-Gómez-Franco and Corak (2019). Campos-Vázquez and Medina-Cortina (2019); Torche (2015); Delajara et al. (2022) also construct a similar index of economic resources but using Principal Components Analysis (PCA).[7] Table 2 shows the variables included in the origin and current household indexes.

[7]PCA is unsuitable for binary indicators unless implemented with tetrachoric correlations

Table 2. Goods and services included in the economic resources index.

Household asset/service	Household at 14 years old	Current Household	Household asset/service	Household at 14 years old	Current Household
Overcrowded household	✓	✓	Bank account	✓	✓
Credit Card	✓	✓	Electricity	✓	✓
Landline	✓	✓	Cellphone		✓
Toaster	✓	✓	Car	✓	✓
Stove	✓	✓	Refrigerator	✓	✓
Drinking water	✓	✓	Tablet		✓
Washing machine	✓	✓	T.V. Set	✓	✓
DVD Player / Cassette recorder		✓	Video-game console		✓
Cable T.V.		✓	Owner of commercial venue	✓	✓
Microwave		✓	Domestic service		✓
Tractor		✓	Owner of another dwelling	✓	✓
Computer		✓	Owner of non-agricultural lands		✓
Owner of inhabited dwelling		✓	Tractor		✓
Internet		✓	Water heater	✓	✓

Note: Source Monroy-Gómez-Franco (Forthcoming)

We rank the current and origin household using their corresponding index, producing a rank distribution of 50 quantiles to minimize the number of ties in the ranking while maximizing the variability of outcomes. The rank of each household is our outcome variable, representing the relative level of economic resources both at origin and in the present. Rank-based measures are more robust to life cycle bias than level-based measures (Nybom and Stuhler, 2017). As a second precaution against life cycle bias, Monroy-Gómez-Franco (Forthcoming) proposes constructing the index upon which the ranks are based for each ten-year cohort in the sample independently. For example, suppose differences exist in the relative importance of a particular asset across cohorts. In that case, the MCA weights underpinning the index will capture that difference and produce a consistent ranking of households.

3. Methods

Here we explain the methods for analyzing differences in mobility patterns by sex conditioned by skin tones. First, we use rank regressions, which estimate the correlation between the rank occupied by the current household of person *i* in the distribution of current households $(R_{i,t})$ and the rank occupied by the same person's origin household in the distribution of origin households $(R_{i,t-1})$. The basic form of this type of regression is the following:

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

in which the β is the intergenerational persistence rate, namely, the degree to which the rank occupied by a household is transmitted from one generation to the next. Moreover, following Chetty et al. (2015), the α cintercept can be interpreted as the expected rank for households that start at the bottom (rank zero) of the distribution of economic resources of the origin households.[8]We adapt this regression to consider differences in the persistence rate and the intercept across different social groups following previous work by Goldsmith et al. (2006, 2007) on the effects of colorism on earnings in the labor market. Let $WT_i^c = 1$ if *i* is a woman with a skin tone from group *c*, and zero otherwise. Similarly, define $MT_i^c = 1$ if *i* is a man with a skin tone from group *c*. The reference group for the estimation is the set of men with a skin tone among the lightest group ($c = 1$). Thus, the resulting equation is

$$R_{it} = \alpha + \beta R_{i,t-1} + \sum_{c=1}^{3} \Phi_c WTi^c + \sum_{c=2}^{3} \Gamma_c MTi^c + \sum_{c=1}^{3} \Theta_c \left(WT_i^c \times R_{i,t-1} \right) + \sum_{c=2}^{3} \eta_c \left(MT_i^c \times R_{i,t-1} \right) + u_i \quad (2)$$

Estimates of Θ_c and η_c capture the differences in persistence rates between men of medium and dark tonalities, women of all tonalities, and men of light skin tone (our reference group). The choice of light skin men as a reference group hinges on the hypothesis that this group is at the top of the Mexican stratification structure when the dimensions of sex and skin tone are considered intersectionally. In other words, the estimates of Φ_c and Γ_c capture the difference in the expected rank of non-light-skinned men, and women of all tonalities at the bottom of the distribution of origin, with respect to the expected rank of light skin men who start at the same position of origin.

The estimates of equation 2 correspond to the unconditional persistence rates and intercepts. Although helpful to describe in general terms the differences in mobility patterns, they might confound the differences associated with skin tones with differences in other circumstances of origin of the different groups. This hinders understanding the mechanisms through which intergenerational outcome differences are produced and sustained. To attenuate this effect, we include a series of control variables to absorb the variation in outcomes associated with other circumstances different from sex and skin tone. We include the average years of parental education, the type of community of origin (whether urban or rural), the parents' ethnic origin, the age of the respondent, and a quadratic term for age. The vector of these control variables is given by X_i. We also include a series of regional dummies following Monroy-Gómez-Franco and Vélez-Grajales (2021) who find that the regional distribution

[8] ϵ_i is the regression's error term.

of skin tones in the country is not random. Represented by τ_r, the dummies denote four of the five regions for which the ESRU-EMOVI 2017 has statistical representativeness (Centro de Estudios Espinosa Yglesias, 2019) and correspond to the respondent's region of origin. The resulting equation 3 is:.

$$R_{it} = \alpha + \beta R_{i,t-1} + \sum_{c=1}^{3} \Phi_c WT_i^c + \sum_{c=2}^{3} \Gamma_c MT_i^c + \sum_{c=1}^{3} \Theta_c \left(WT_i^c \times R_{i,t-1} \right) + \sum_{c=2}^{3} \eta_c \left(MT_i^c \times R_{i,t-1} \right) + \sum_{r=1}^{4} \tau_r + \delta X_i + u_i \quad (3)$$

Additionally, we are interested in analyzing whether the relationship between skin tone and sex is constant across the distribution of economic resources, which equation 3 does not allow us to explore. For this reason, we also estimate a series of quantile rank regressions at different parts of the current distribution of economic resources and the transition probabilities of the different social subgroups. Transition probabilities are the conditional probabilities that a person starting at quantile *o* reaches quantile *d*. We divide the distribution of origin and current economic resources into five quintiles to calculate transition probabilities. Defining N_o^d as the population with origin in quintile *o* and currently in quantile *d* and N_o the population with origin in quintile *o*, we can define the transition probability between quantile *o* and quantile *d*, $P_{[d|o]}$, as follows

$$P_{[d|o]} = \frac{N_o^d}{N_o} \quad (4)$$

The corresponding 25 transition probabilities are then collected into a transition matrix $M_{d,o}$ of 5×5 dimension, in which the rows correspond to the quintile of origin, and the columns correspond to the current quintile. Formally this is:

$$M_{d,o} \equiv \begin{bmatrix} P_{1|1} & \dots & P_{5|1} \\ \vdots & \vdots & \vdots \\ P_{1|5} & \dots & P_{5|5} \end{bmatrix} \quad (5)$$

The quantiles for the transition matrices and the rank-rank regressions are defined for the complete sample. That is, for the pool of men and women of different skin tonalities. This allows for comparing the intergenerational movements of the different subgroups by providing a common support for them. The downside is that the concept of mobility being measured is a non-strictly positional mobility concept Deutscher and Mazumder (Forthcoming).

4. Results

We estimate equation 3 for the total sample and four subsamples defined by the household of origin arrangement. Table 1 shows that these origin groups do not represent equal shares of our sample and the Mexican population. In particular, the sample sizes of respondents who lived with a single father when 14 and respondents who lived with both parents and the mother was the household head are relatively small. Consequently, the estimations for both subgroups are substantially less precise than for the rest of the population.

Table 3 shows the results of these estimations. We focus on the results for the total sample and the two largest subgroups: respondents who lived with a single mother when 14 years old and respondents who lived with both parents in a male-headed household when 14 years old. The first result of interest is that light-skin women have the same intergenerational mobility pattern as light-skin men, as neither the intergenerational persistence rate nor the intercept for this subgroup is statistically different from that of the reference group: light skin men. This result holds for the total sample, the single mothers, and the dual-parent, male-headed household subsamples.

The second key result is that the intercepts for women of medium and dark skin tones are smaller than for light-skin men. However, when comparing men within themselves, only those of the darkest tones face a penalization compared to their light-skin peers in terms of the rank intercept. This result suggests that skin tone stratification is different across sexes, as less prominent deviations from the social preference for light skin tones (the colorist preference) are penalized in women but not men. Thirdly, our results suggest that all the groups experience the same average persistence rate, as there are no statistically significant differences in the slope coefficients by sex and skin tone group. This result is consistent with previous evidence by Campos-Vázquez and Medina-Cortina (2019); Monroy-Gómez-Franco and Vélez-Grajales (2021), and Monroy-Gómez-Franco (Forthcoming). They suggest that the significant average intergenerational persistence rate observed at the national level affects all groups but that the distribution point in which those groups persist is different (as captured by the different intercepts). We observe this result for the whole sample and the two subsamples of interest. We add to this finding that the intercepts of the skin tone groups also vary depending on sex, and the sex gradient is not homogenous across them, i.e., it is not significant for light-skin persons, while it is significant for dark-skinned persons, for example.

Finally, we find that, at least in the case of single-mother households and male-headed double-parent households, the arrangement of the household of origin does not seem to produce a variation in the mobility patterns by skin tone and sex. Table 3 shows that the effects across these three samples are not significantly different. In the case of the other two subgroups, there are no statistically

Table 3. Main regression, conditional persistence rates

Dependent variable: current rank	Full sample	Single mother	Single father	Dual parent, male hh	Dual parent, female hh
Origin rank	0.430 (0.027)	0.416 (0.054)	0.414 (0.084)	0.425 (0.030)	0.545 (0.076)
Female respondent, light skin tone	-1.155 (1.112)	-1.007 (2.258)	6.315 (6.585)	-2.093 (1.240	8.508 (3.354)
Female respondent, medium skin tone	-2.208 (0.919)	-3.144 (1.774)	3.247 (3.219)	-2.388 (1.107)	2.108 (2.689)
Female respondent, dark skin tone	-3.477 (1.128)	-4.846 (2.280)	-0.587 (4.456)	-4.141 (1.234)	4.752 (4.995)
Male respondent, medium skin tone	-1.308 (0.933)	-2.900 (1.854)	2.392 (3.806)	-1.403 (1.076)	4.716 (2.972)
Male respondent, dark skin tone	-3.469 (1.166)	-7.318 (2.799)	1.768 (3.960)	-3.688 (1.289)	5.871 (4.651)
Light skin female × origin rank	0.004 (0.029)	0.037 (0.070)	-0.166 (0.171)	0.019 (0.032)	-0.208 (0.098)
Medium skin female × origin rank	-0.021 (0.026)	0.046 (0.059)	-0.128 (0.098)	-0.022 (0.030)	-0.094 (0.071)
Dark skin female × origin rank	-0.050 (0.043)	0.064 (0.090)	-0.018 (0.186)	-0.041 (0.046)	-0.327 (0.219)
Medium skin male × origin rank	-0.009 (0.026)	0.065 (0.056)	-0.108 (0.103)	-0.010 (0.030)	-0.141 (0.080)
Dark skin male × origin rank	-0.012 (0.039)	0.133 (0.102)	-0.208 (0.134)	-0.004 (0.041)	-0.315 (0.156)
Intercept	1.468 (1.833)	1.727 (4.218)	9.211 (5.853)	1.096 (1.773)	3.872 (6.239)
Controls	✓	✓	✓	✓	✓
Observations	37,269	4,912	1,156	29,257	1,797
R-squared	0.468	0.445	0.389	0.468	0.409

Notes: Standard errors clustered at the primary sampling unit. The column of single mother (respectively father) households corresponds to the sample of respondents whose origin household was headed by a single mother (respectively father). The columns of dual-parent households correspond to the ample of respondents whose origin household had both parents present, varying the primary economic support (household head, hh) by sex. The estimations consider a series of regional dummies to control for the non-random distribution of skin tones across the country. Controls include the maximum years of schooling of the parents, age, age squared, the ethnic origin of the parents, and if the community of origin was a rural community. The reference group for all estimations is light-skin men.

significant effects associated with the skin tone and sex of the respondent. Given both groups' small sample sizes, it is impossible to determine whether this outcome results from the lower precision of the estimates for these subgroups. More work focused on these two subpopulations is needed to disentangle the roots of these null results.

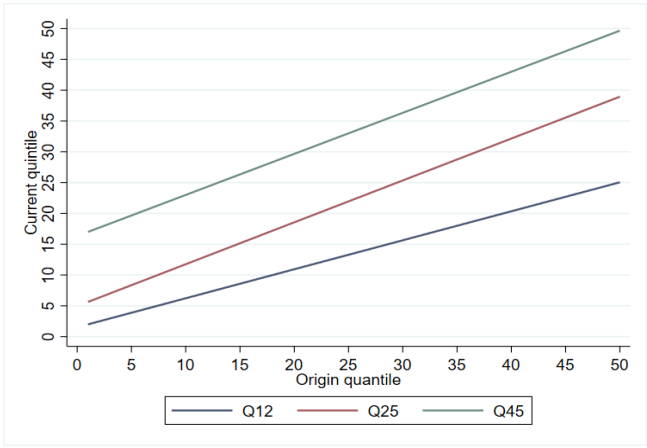
The second step in our analysis consists of exploring if the relationship between skin tone, sex, and intergenerational persistence varies according to the position of the person in the distribution of current economic resources. We estimate a series of quantile regressions for this purpose. Figure 2 shows the results for the curves corresponding to the estimates of the quantile regressions at the 12th, 25th, and 45th ranks out of 50 for each sex and skin tone subgroup.

The estimates from the quantile regression add complexity to the intergenerational mobility patterns implicit in the previous results. Firstly, the results indicate that, independently of the skin tone or sex of the respondent, the intergenerational rank persistence increases as one moves upwards in the distribution of economic resources. Secondly, the mobility patterns of light-skin men and women are equal, regardless of the person's position in the distribution of current economic resources. Thirdly, women of medium and dark skin tones have lower persistence rates at the top of the distribution than men of the same skin tone. This result explains the findings of Torche (2015), suggesting that the mobility patterns of these subgroups of women drive them. Furthermore, in the case of women of dark and medium skin tones, the gap in expected rank with respect to light-skin men increases as the current rank of the person increases. In the case of men, this pattern holds only for dark-skin men.

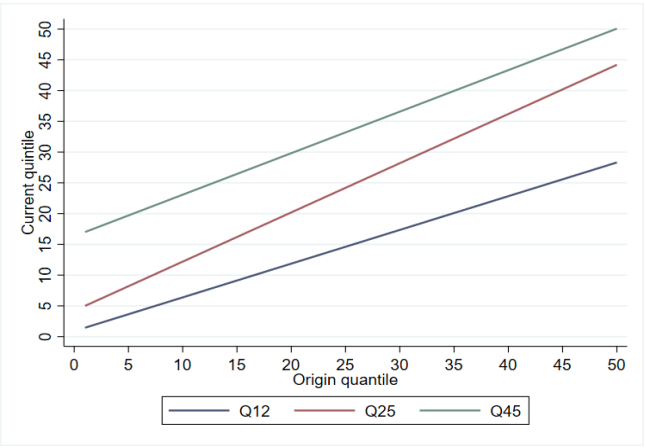
We further explore these results by estimating the transition matrices for each of the subgroups of interest. We focus on the persistence at the extremes of the distribution of current economic resources, namely, the conditional probabilities of currently being in the first quintile conditional on being in the first quintile when 14 years old, and the conditional probability of being in the fifth quintile conditional on being in the fifth quintile when 14 years old. Figure 3 shows these conditional probabilities for the eight groups.

Figure 3 shows overlaps in the 95% confidence intervals around the persistence probabilities of men and women of light-skin tone at both extremes of the distribution, providing more evidence supporting the previous results showing no differences in the mobility pattern of light skin men and women. Tables 4 and 5 show the t-tests of the comparison of persistence rates at both extremes of the distribution. Interestingly, the point estimate of the persistence probability at the bottom of the distribution for light-skin women is the smallest, and the difference with the persistence rate of each of the other non-light-skin tone groups is statistically significant. This is not the case for light-skin men, who experience a persistence rate similar to the one experienced by medium skin-tone men

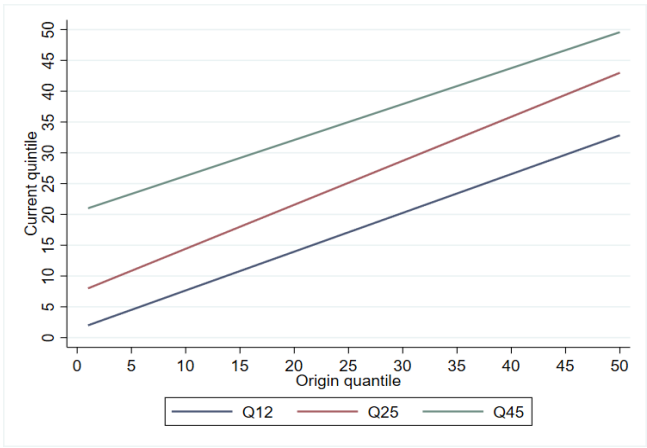
Figure 2. Quantile rank-rank regression estimates
(Total sample)



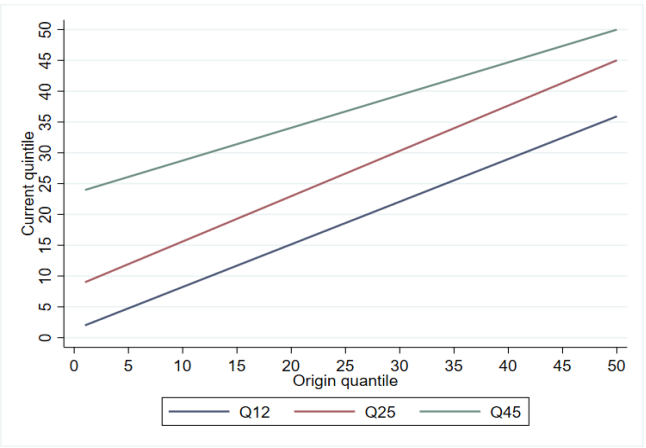
(a) Dark skin women



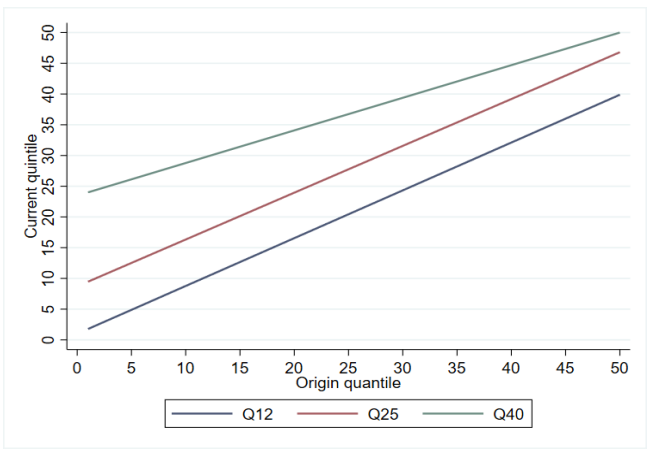
(b) Dark skin men



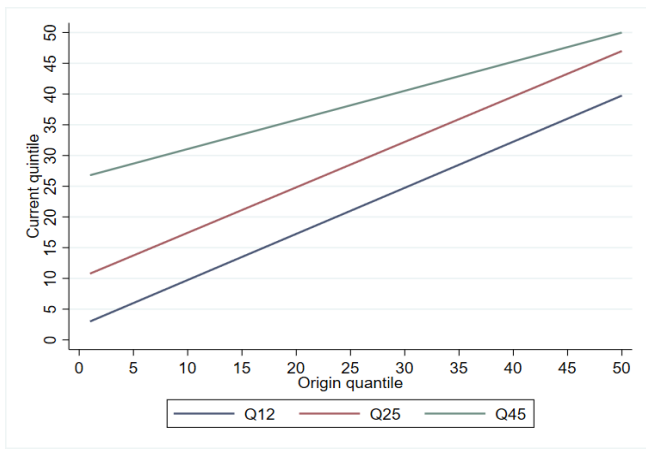
(c) Medium skin tone women



(d) Medium skin tone men



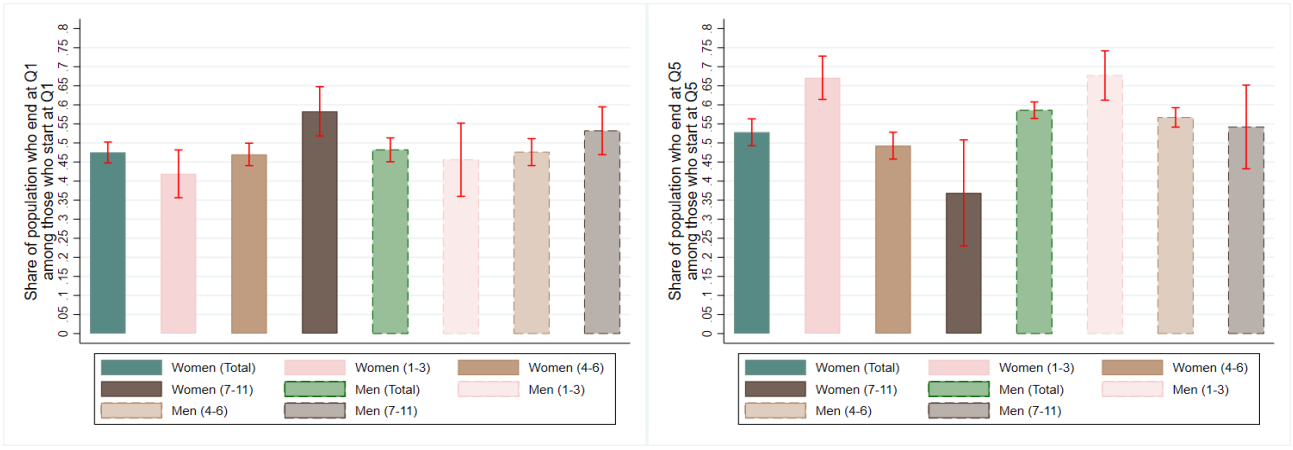
(e) Light skin women



(f) Light skin men

Notes: Quantiles are defined over the national population. Sampling weights employed.

Figure 3. Persistence at the extremes of the distribution
(Total sample)



(a) Persistence at Q1 **(b)** Persistence at Q5

Quantiles are defined over the national population. Sampling weights employed. Cluster standard errors by primary sampling unit. The complete transition matrices are in tables A1-A8 of the appendix.

and women. In contrast, dark skin-tone women experience the largest persistence rate at the bottom, being the difference with each of the other groups statistically significant. On the other hand, in the case of persistence at the bottom of the distribution, dark-skin women show a higher persistence probability than the members of the other groups of women and the average persistence rate of men, which is statistically significant.

At the other end of the distribution, we find that men's average persistence rate is higher than women's, confirming Torche's (2015) findings. However, when we disaggregate by skin tone, we find that light-skin men's and women's persistence rates are not statistically significantly different, as shown in Table 5.. Both groups have the largest persistence rate at the top of the distribution. Men of medium and dark skin tones have a similar persistence rate at the top, smaller than that of the light skin groups but larger than those of their female peers. The group with the lowest persistence rate at the top of the distribution is dark-skinned women, followed by medium skin tone women and dark-skinned men. Except for the difference between dark-skinned men and medium skin tone women, which is imprecisely estimated, the rest are statistically significant.

These differences are economically relevant. For example, in the case of women, the gap between the persistence rate at the top quintile for light-skin women and the average persistence rate of all women is 15 percentage points. That is equivalent to the probability that a woman who starts at the bottom quintile reaches the distribution's median (see table A1). Similarly, the gap between light and dark-skin women in their persistence rates at the top is 30 percentage points, which is more than

Table 4. Comparisons of persistence probabilities at Q1 conditional on starting at Q1

Comparison	t-statistic	Difference	SE
Light skin tone men vs. medium skin tone men	0.948	0.034	0.036
Light skin tone men vs. dark skin tone men	-2.042	-0.073	0.036
Light skin tone men vs. light skin tone women	-0.045	-0.002	0.036
Light skin tone men vs. medium skin tone women	-0.530	-0.016	0.030
Light skin tone men vs. dark skin tone women	-3.914	-0.145	0.037
Medium skin tone men vs. dark skin tone men	-2.373	-0.578	0.024
Medium skin tone men vs. light skin tone women	2.145	0.050	0.023
Medium skin tone men vs. medium skin tone women	-0.031	-0.000	0.012
Medium skin tone men vs. dark skin tone women	-5.263	-0.129	0.024
Dark skin tone men vs. light skin tone women	3.511	0.108	0.031
Dark skin tone men vs. medium skin tone women	2.442	0.057	0.024
Dark skin tone men vs. dark skin tone women	-2.263	-0.071	0.032
Light skin tone women vs. medium skin tone women	-2.247	-0.050	0.022
Light skin tone women vs. dark skin tone women	-5.807	0.179	0.031
Dark skin tone women vs. medium skin tone women	-5.336	-0.129	0.024

Notes: Constructed with information from the transition matrices A1-A8

the probability that a woman with origin at the bottom reaches the median or a further up position in the current distribution. In the case of men, the gap between men with light-skin tones and the average for the group is eight percentage points, which is larger than the probability that a person who starts at the top quintile falls below the median in adulthood.

Our results suggest that the Mexican stratification regime implies a colorist ordering for men and women regarding the intergenerational transmission of economic resources. Moreover, given that most contemporary colorist orderings discriminate in favor of lighter skin tones and penalize deviations from them, our results show that in Mexican society, the colorist regime of the stratification

Table 5. Comparisons of persistence probabilities at Q5 conditional on starting at Q55

Comparison	t-statistic	Difference	SE
Light skin tone men vs. medium skin tone men	4.237	0.094	0.022
Light skin tone men vs. dark skin tone men	2.542	0.102	0.040
Light skin tone men vs. light skin tone women	-0.047	-0.012	0.026
Light skin tone men vs. medium skin tone women	7.644	0.168	0.022
Light skin tone men vs. dark skin tone women	5.286	0.284	0.054
Medium skin tone men vs. dark skin tone men	0.218	0.008	0.036
Medium skin tone men vs. light skin tone women	-5.632	-0.106	0.019
Medium skin tone men vs. medium skin tone women	5.663	0.074	0.013
Medium skin tone men vs. dark skin tone women	3.749	0.190	0.051
Dark skin tone men vs. light skin tone women	-2.963	-0.114	0.038
Dark skin tone men vs. medium skin tone women	1.840	0.066	0.036
Dark skin tone men vs. dark skin tone women	3.001	0.182	0.061
Light skin tone women vs. medium skin tone women	9.680	0.180	0.019
Light skin tone women vs. dark skin tone women	5.646	0.296	0.052
Dark skin tone women vs. medium skin tone women	2.296	0.116	0.051

Notes: Constructed with information from the transition matrices A1-A8

system is stricter for women than men. This is because we observe a penalization among women of medium and dark skin tones regarding the expected rank achieved. In contrast, we only observe the same pattern for dark-skinned men. Similarly, we observe that a light skin tone implies a higher probability of persisting at the top of the distribution, regardless of sex.

5. Final Remarks

"Intersectionality is a metaphor for understanding the ways that multiple forms of inequality or disadvantage sometimes compound themselves and create obstacles that often are not understood among conventional ways of thinking." (Crenshaw, 1989). Since its proposal, intersectionality has provided a fertile ground for myriad research on inequality and disadvantage. We have sought to investigate the implications of intersecting sex and skin tone on economic mobility in Mexico. To the best of our knowledge, this is the first such attempt. Moreover, we strove to isolate mobility patterns related explicitly to these birth characteristics by controlling for potentially confounding factors associated with these intersected traits and jointly with our economic outcome of interest. Finally, we explored an additional interaction layer by analyzing four household arrangements.

We found a tapestry of different and similar mobility patterns. Among the most salient ones, we could not find any evidence of sex differences in intergenerational economic mobility among light-skinned people. By contrast, among people with intermediate and dark skin tones, respectively, women were penalized with higher downward mobility rates from the top. Additionally, we found steeper color gradients among women (favoring lighter-skinned women with higher expected ranks from the same initial position and higher upward mobility from the bottom and lower downward mobility from the top) than men.

Future research should delve deeper into the causes behind these patterns, chiefly different sex inequalities in mobility as we move across the skin-tone spectrum and different coloring gradients within populations of different sex.

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Appendix A. Transition matrices

Table A1. Transition matrix
(All women)

	Current Q1	Current Q2	Current Q3	Current Q4	Current Q5
Origin Q1	0.0.475 (0.014)	0.277 (0.010)	0.152 (0.007)	0.072 (0.006)	0.024 (0.003)
Origin Q2	0.299 (0.014)	0.304 (0.010)	0.231 (0.012)	0.125 (0.018)	0.040 (0.005)
Origin Q3	0.135 (0.008)	0.252 (0.008)	0.275 (0.009)	0.233 (0.009)	0.104 (0.007)
Origin Q4	0.054 (0.005)	0.165 (0.008)	0.242 (0.009)	0.306 (0.010)	0.232 (0.011)
Origin Q5	0.019 (0.003)	0.063 (0.006)	0.122 (0.007)	0.268 (0.013)	0.528 (0.018)

Note: Survey weights employed. Quintiles are defined over the national distribution of the economic resources distribution of the origin and current households. Each entry in the matrix indicates the share of women from each origin quintile (rows) that reach each quintile in the distribution of the current households (columns). Consequently, the sum of the columns of the matrix for each row is equal to one.

Table A2. Transition matrix of economic resources
(All men)

	Current Q1	Current Q2	Current Q3	Current Q4	Current Q5
Origin Q1	0.482 (0.016)	0.254 (0.011)	0.158 (0.010)	0.075 (0.007)	0.031 (0.005)
Origin Q2	0.268 (0.014)	0.275 (0.011)	0.227 (0.012)	0.145 (0.011)	0.085 (0.010)
Origin Q3	0.125 (0.009)	0.220 (0.012)	0.277 (0.014)	0.239 (0.013)	0.139 (0.010)
Origin Q4	0.061 (0.006)	0.137 (0.009)	0.223 (0.011)	0.317 (0.013)	0.263 (0.013)
Origin Q5	0.018 (0.003)	0.040 (0.004)	0.108 (0.008)	0.248 (0.011)	0.586 (0.011)

Note: Survey weights employed. Quintiles are defined over the national distribution of the economic resources distribution of the origin and current households. Each entry in the matrix indicates the share of men from each origin quintile (rows) that reach each quintile in the distribution of the current households (columns). Consequently, the sum of the columns of the matrix for each row is equal to one.

Table A3. Transition matrix
(Light-skin women)

	Current Q1	Current Q2	Current Q3	Current Q4	Current Q5
Origin Q1	0.0.419 (0.032)	0.282 (0.027)	0.166 (0.020)	0.084 (0.014)	0.049 (0.023)
Origin Q2	0.207 (0.035)	0.315 (0.030)	0.249 (0.032)	0.151 (0.025)	0.079 (0.021)
Origin Q3	0.100 (0.020)	0.201 (0.022)	0.263 (0.027)	0.285 (0.031)	0.155 (0.024)
Origin Q4	0.038 (0.009)	0.128 (0.019)	0.244 (0.028)	0.326 (0.031)	0.263 (0.028)
Origin Q5	0.007 (0.003)	0.034 (0.007)	0.080 (0.011)	0.208 (0.023)	0.671 (0.029)

Note: Survey weights employed. Quintiles are defined over the national distribution of the economic resources distribution of the origin and current households. Each entry in the matrix indicates the share of light skin women from each origin quintile (rows) that reach each quintile in the distribution of the current households (columns). Consequently, the sum of the columns of the matrix for each row is equal to one.

Table A4. Transition matrix of economic resources
(Light skin men)

	Current Q1	Current Q2	Current Q3	Current Q4	Current Q5
Origin Q1	0.456 (0.049)	0.240 (0.035)	0.197 (0.040)	0.081 (0.018)	0.026 (0.013)
Origin Q2	0.211 (0.048)	0.235 (0.043)	0.291 (0.049)	0.169 (0.034)	0.094 (0.030)
Origin Q3	0.045 (0.012)	0.168 (0.021)	0.285 (0.035)	0.309 (0.042)	0.193 (0.032)
Origin Q4	0.033 (0.010)	0.110 (0.021)	0.194 (0.035)	0.420 (0.042)	0.243 (0.032)
Origin Q5	0.006 (0.003)	0.022 (0.008)	0.069 (0.013)	0.227 (0.029)	0.677 (0.033)

Note: Survey weights employed. Quintiles are defined over the national distribution of the economic resources distribution of the origin and current households. Each entry in the matrix indicates the share of light skin men from each origin quintile (rows) that reach each quintile in the distribution of the current households (columns). Consequently, the sum of the columns of the matrix for each row is equal to one.

Table A5. Transition matrix
(Medium skin tone women)

	Current Q1	Current Q2	Current Q3	Current Q4	Current Q5
Origin Q1	0.0.470 (0.015)	0.279 (0.010)	0.156 (0.008)	0.076 (0.007)	0.020 (0.003)
Origin Q2	0.308 (0.016)	0.302 (0.011)	0.232 (0.013)	0.122 (0.009)	0.036 (0.005)
Origin Q3	0.138 (0.008)	0.256 (0.010)	0.278 (0.011)	0.229 (0.010)	0.099 (0.007)
Origin Q4	0.055 (0.005)	0.169 (0.010)	0.244 (0.010)	0.304 (0.011)	0.228 (0.012)
Origin Q5	0.021 (0.003)	0.070 (0.007)	0.132 (0.008)	0.285 (0.015)	0.493 (0.018)

Note: Survey weights employed. Quintiles are defined over the national distribution of the economic resources distribution of the origin and current households. Each entry in the matrix indicates the share of medium skin tone women from each origin quintile (rows) that reach each quintile in the distribution of the current households (columns). Consequently, the sum of the columns of the matrix for each row is equal to one.

Table A6. Transition matrix of economic resources
(Medium skin tone men)

	Current Q1	Current Q2	Current Q3	Current Q4	Current Q5
Origin Q1	0.476 (0.018)	0.253 (0.013)	0.162 (0.011)	0.080 (0.008)	0.030 (0.005)
Origin Q2	0.255 (0.015)	0.279 (0.013)	0.223 (0.013)	0.152 (0.013)	0.091 (0.013)
Origin Q3	0.122 (0.010)	0.219 (0.014)	0.283 (0.015)	0.236 (0.014)	0.140 (0.011)
Origin Q4	0.061 (0.006)	0.133 (0.010)	0.225 (0.012)	0.312 (0.013)	0.268 (0.014)
Origin Q5	0.019 (0.004)	0.042 (0.005)	0.118 (0.009)	0.254 (0.013)	0.567 (0.013)

Note: Survey weights employed. Quintiles are defined over the national distribution of the economic resources distribution of the origin and current households. Each entry in the matrix indicates the share of medium skin tone men from each origin quintile (rows) that reach each quintile in the distribution of the current households (columns). Consequently, the sum of the columns of the matrix for each row is equal to one.

Table A7. Transition matrix
(Dark skin tone women)

	Current Q1	Current Q2	Current Q3	Current Q4	Current Q5
Origin Q1	0.0.583 (0.033)	0.260 (0.033)	0.105 (0.019)	0.026 (0.008)	0.028 (0.010)
Origin Q2	0.334 (0.041)	0.321 (0.041)	0.196 (0.056)	0.123 (0.027)	0.026 (0.011)
Origin Q3	0.178 (0.032)	0.332 (0.055)	0.254 (0.042)	0.163 (0.035)	0.072 (0.020)
Origin Q4	0.110 (0.049)	0.215 (0.044)	0.188 (0.050)	0.285 (0.065)	0.202 (0.053)
Origin Q5	0.073 (0.031)	0.103 (0.042)	0.189 (0.050)	0.266 (0.065)	0.369 (0.071)

Note: Survey weights employed. Quintiles are defined over the national distribution of the economic resources distribution of the origin and current households. Each entry in the matrix indicates the share of dark skin tone women from each origin quintile (rows) that reach each quintile in the distribution of the current households (columns). Consequently, the sum of the columns of the matrix for each row is equal to one.

Table A8. Transition matrix of economic resources
(Dark skin tone men)

	Current Q1	Current Q2	Current Q3	Current Q4	Current Q5
Origin Q1	0.532 (0.032)	0.274 (0.026)	0.109 (0.016)	0.045 (0.015)	0.039 (0.014)
Origin Q2	0.381 (0.042)	0.278 (0.036)	0.215 (0.038)	0.082 (0.018)	0.045 (0.014)
Origin Q3	0.215 (0.038)	0.280 (0.035)	0.217 (0.039)	0.202 (0.035)	0.087 (0.022)
Origin Q4	0.094 (0.025)	0.213 (0.033)	0.234 (0.033)	0.231 (0.033)	0.228 (0.035)
Origin Q5	0.045 (0.019)	0.070 (0.020)	0.111 (0.026)	0.233 (0.043)	0.542 (0.056)

Note: Survey weights employed. Quintiles are defined over the national distribution of the economic resources distribution of the origin and current households. Each entry in the matrix indicates the share of dark skin tone men from each origin quintile (rows) that reach each quintile in the distribution of the current households (columns). Consequently, the sum of the columns of the matrix for each row is equal to one.