ASOCIACION ARGENTINA
DE ECONOMIA POLITICA

LIV REUNIÓN ANUAL| NOVIEMBRE DE 2019

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ISSN 1852-0022 / ISBN 978-987-28590-7-7

Social Mobility and Economic Performance

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Proposal for CEPAL Summer School.
Inequality Measurement, analysis and policies.

Topic: Intergenerational Persistence of Inequalities.

Very preliminary draft! Please, do not quote!

1. Introduction

Latin America is one of the most unequal regions of the world. After several decades with poor results in socioeconomic terms, the region experienced a remarkable inequality decline during the first decade of the 21st century (Gasparini et al., 2016; Tornarolli et al. 2018). At the same time, social mobility has been rising considerably in most countries in the region (Neidhöfer et al., 2018). This changing dynamics in income inequality and social mobility experienced by the region attracts special attention by researchers and policy makers. The aim of this study is to estimate the consequences of these developments for economic performance.

Economic reasoning suggests that social mobility, understood as the opportunity for families to improve their socioeconomic status over the course of generations, and economic performance are positively interrelated. For instance, in the models developed by Galor and Tsiddon (1997) and Hassler and Mora (2000), technological progress is shown to lead to higher rates of upward mobility, and, consequently, to economic growth. Chetty et al. (2014a) show that in US counties with higher rates of social mobility, labor force participation is higher and the poor seem to be less segregated. Güell et al. (2018) find that Italian provinces with higher social mobility display better economic performance and social capital, while Neidhöfer et al. (2018) finds that upward mobility is correlated with higher GDP per capita over time across Latin American economies in a country-level analysis.

This rather suggestive descriptive evidence indicates the need for a deeper analysis, one which aims to investigate the causal relationship between upward mobility and economic performance indicators. Furthermore, the channels that generate this relationship – like the education system, and the inclusiveness of the labor market as possible mechanisms for improving social mobility (see e.g. Corak, 2013) – must be identified and sized in order to better give policy advice on how to improve economic performance through social mobility.

Our novel proposed approach to test the hypothesized positive role of social mobility for the economy differs from the existing literature. In our application we explore the relationship between mobility and economic performance by exploiting a novel panel data set of inter-generational education mobility indicators at the sub-national level, estimated from microdata of harmonized national household surveys in 10 Latin American countries. We study the relationship between mobility and various measures of economic performance using fixed effects and GMM models.

We follow the scant empirical literature on the effect of equality of opportunity on economic growth, much like the application of Marrero and Rodriguez (2013) to the US-context and extend it to the concept of social mobility. Social mobility hereby acts

as a useful proxy measure for the level of equality of opportunity in a society, while its estimation is less data demanding. This enables us to address the issue, in an analysis that spans multiple countries, subnational regions, and over a long time-span.

The project also contributes to the literature on the geography of social mobility recently developed by Chetty et al. (2014b), Corak (2019), Chetty and Hendren (2018), Fletcher and Han (2018), Biasi (2019), and Connolly et al. (2019) mainly for the US and Canada. The main analysis comprises subnational regions of Latin American countries, based on household surveys from ten countries with retrospective information about parent's education level.

2. Empirical Strategy

The aim of the project is to test the hypothesized positive role of social mobility for economic performance using subnational regions as unit of analysis. An advantage of dealing with subnational regions instead of countries is that the heterogeneity between regions does not depend on features that vary strongly at the country level, for instance the political process as well as institutional or cultural differences.

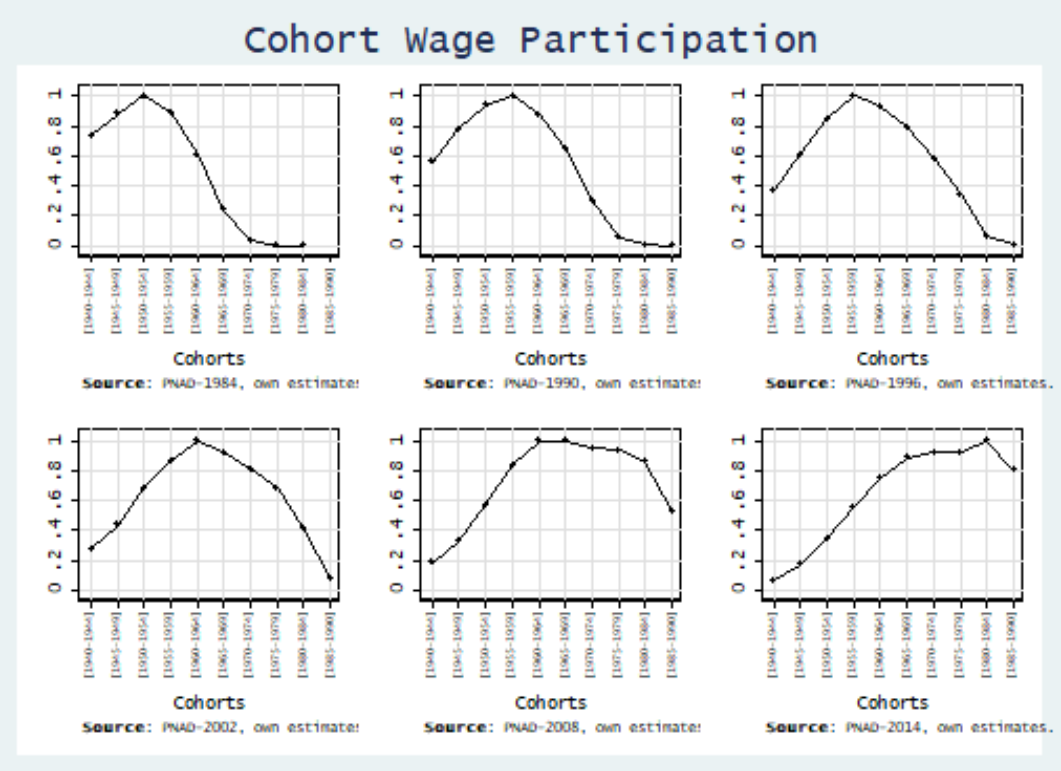
The following empirical model is estimated:

$$Y_{rc,t} = \beta M_{rc,t} + \gamma X_{rc,t} + \delta D_{rc,t} + \zeta C_{ct} + \tau_t + \epsilon_{rct.} \qquad (1)$$

Y is a measure for economic performance in the subnational region r of country c in year t. M is the degree of social mobility, our main variable of interest, measured by the weighted average level of social intergenerational mobility of people in region r in of country c year t. X are regional controls in year t. D are controls for weighted average demographic characteristics of all cohorts in year t and region r. C are country level characteristics. Lastly, ϵ is the error term.

The weights to estimate the weighted average level of mobility in year t are computed based on the cohort's contribution to the country's economic performance in the respective year, using the cohort's share in total wages. This procedure can be seen more clearly in Figure 1 when we show, as an example, the mentioned weights for Brazil every five years. As it was expected, younger cohorts increase their participation in total wages for recent years while the participation of older cohorts decreases. This approach was developed to proportionally associate economic performance in period t to the social mobility experienced by individuals born in different cohorts who in this period are at different stages of their individual contribution to the economy for reasons related to life cycle.

Figure 1. Cohort weights example.



Our main coefficient of interest is β. As a first step, equation (1) will be estimated exploiting the inter-regional variation in Y and M adopting linear regression analysis, not aiming at causality. In this case, β estimates whether regions with higher rates of social mobility on average show stronger economic performance. In a second step, the error term will be modeled to be composed of two components that are both i.i.d: $\epsilon_{rct} = u_{rc} + v_{rct}$. The inclusion of region fixed effects (u_{rc}) in the model, besides of time fixed effects (τ_t), takes a first step towards a causal interpretation of β, since the identification relies on the intra-regional variation of social mobility and economic performance.

However, also in the fixed effects model, at least one of the explanatory variables is correlated with the error term, particularly the lagged dependent variable, causing biased estimates. As shown by Nickell (1981) this problem is less serious in samples characterized by long time series, which is, however, not the case in our application, since the panel comprises a large number of subnational regions over a rather short time period.

In the next step equation (1) will be estimated as a Dynamic Panel Data Model, employing difference GMM (Arellano and Bond, 1991) and system GMM (Arellano and Bover, 1995; Blundell and Bond, 1998) that use internal instruments to estimate the parameters of interest consistently when the lagged dependent variable is included as

an explanatory variable. Taking first differences of equation (1) eliminates the regional fixed effect u_{rc}. The difference GMM estimator exploits further lags of the dependent variable (e.g. $Y_{rc,t-2}, Y_{rc,t-3}$, …) and lags of the independent variables as instruments in the first differenced equation (e.g. $M_{rc,t-2}, M_{rc,t-3}, \ldots; X_{rc,t-1}, X_{rc,t-2}$, …). Applying system-GMM, the model is specified in levels and uses lagged differences as instruments in the level equation. If the instruments do not turn out to be weakly correlated with the regressors and in absence of autocorrelation of the error term v_{rct}, system-GMM yields consistent coefficients showing the effect of social mobility on economic performance.

3. Preliminary Results

The main source to compute social mobility indexes are household surveys from 10 Latin American countries with retrospective questions about parents education, specified in Table 1. However those surveys do not have comparable information between them. Consequently, we have performed an harmonization process. In particular, we impute years of education when the only available information are the highest completed educational level. Otherwise, we generate years of schooling using information on the highest completed educational level combined with the highest grade attained, and then we recodified the variable. On the other hand, we use harmonized household surveys from SEDLAC (CEDLAS and World Bank) to compute total incomes as well as several control variables used in our analysis.

Table 1. Surveys used to compute social mobility indexes.

Country	Survey	Year	Information of parents' education
Argentina	ENES	2014	father, mother
Brazil	PNAD	2014	father, mother
Chile	CASEN	2006	father, mother
		2009	father, mother
		2011, 2013, 2015	father, mother
Colombia	ECV	2003, 2008, 2010, 2011, 2012, 2013, 2014	father, mother
Ecuador	ECV	1994, 1995	father, mother
		1998, 2006, 2014	father, mother
Guatemala	ENCOVI	2000, 2006, 2011	father, mother
Mexico	MXFLS	2002, 2005-2006, 2009-2012	father, mother
Nicaragua	EMNV	1998	father, mother
Panama	ENV	1997, 2003, 2008	father, mother
Peru	ENAHO	2001	father, mother
		2002-2015	father, mother

Before reporting the estimated relationship between social mobility and economic performance, it is worthwhile to show the trends of intergenerational mobility calculated from household surveys with retrospective information about parent's level of education archived. Figures 2-4 presents scatter plots linking several mobility indexes experienced by people belonging to the first cohort of our analysis and people born in the last one. The indexes trends described covers relative and absolute dimensions of intergenerational mobility, understood as the movements of families within the distribution over time, as well as the dimension of those movements. Figures 2-4 present intergenerational persistence, probability of upward mobility and directional educational change measures for both cohorts.

Figure 2. Intergenerational persistence. Older and younger cohorts.

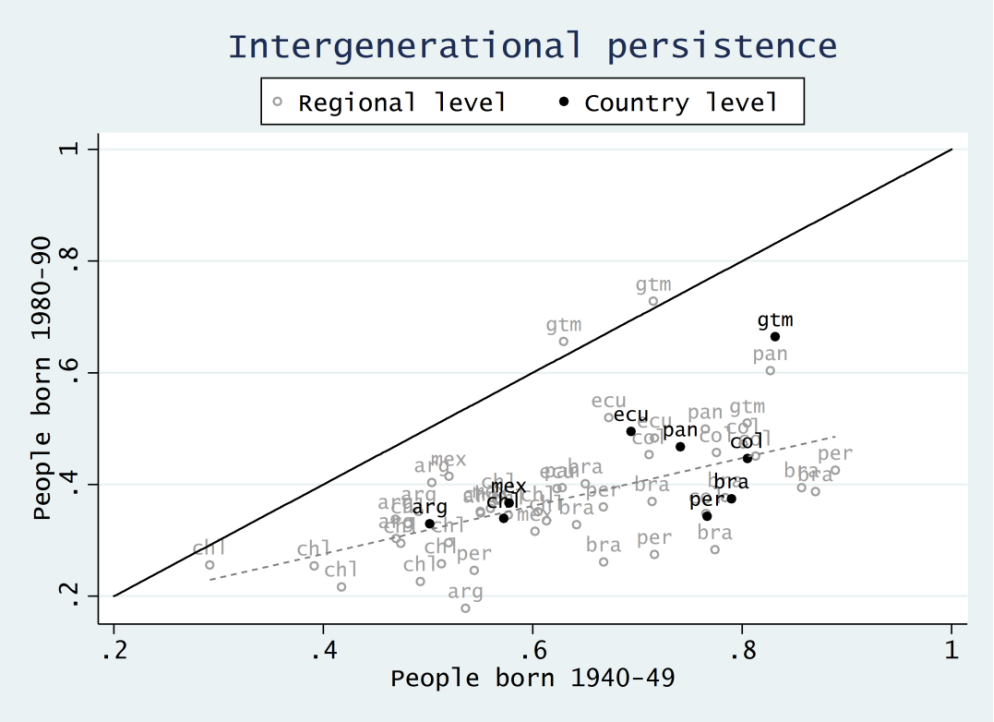


Figure 3. Probability of upward mobility. Older and younger cohorts.

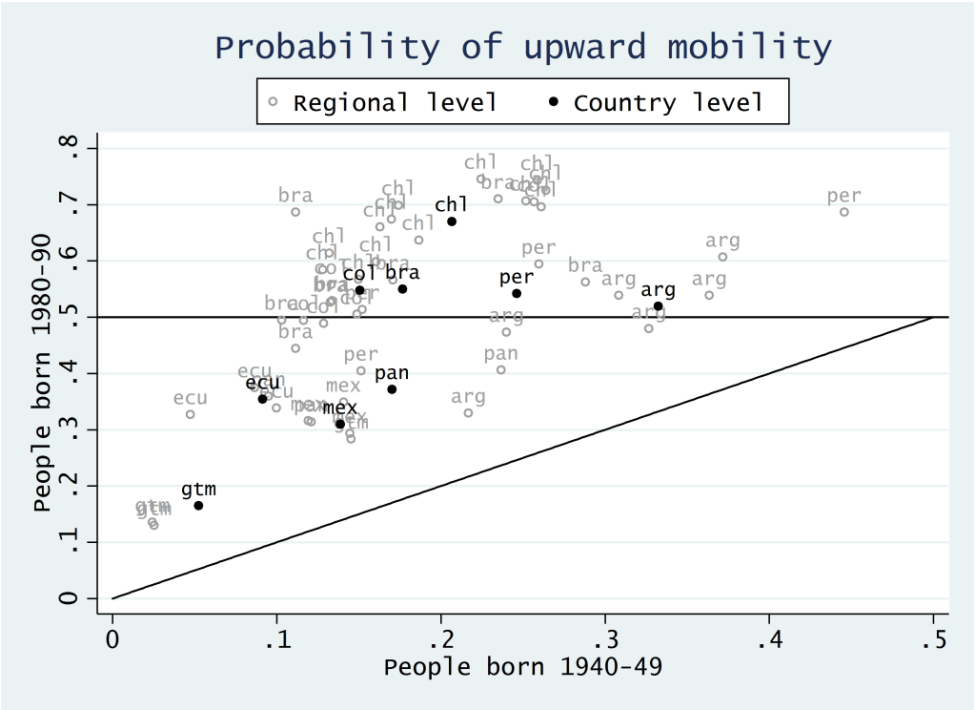
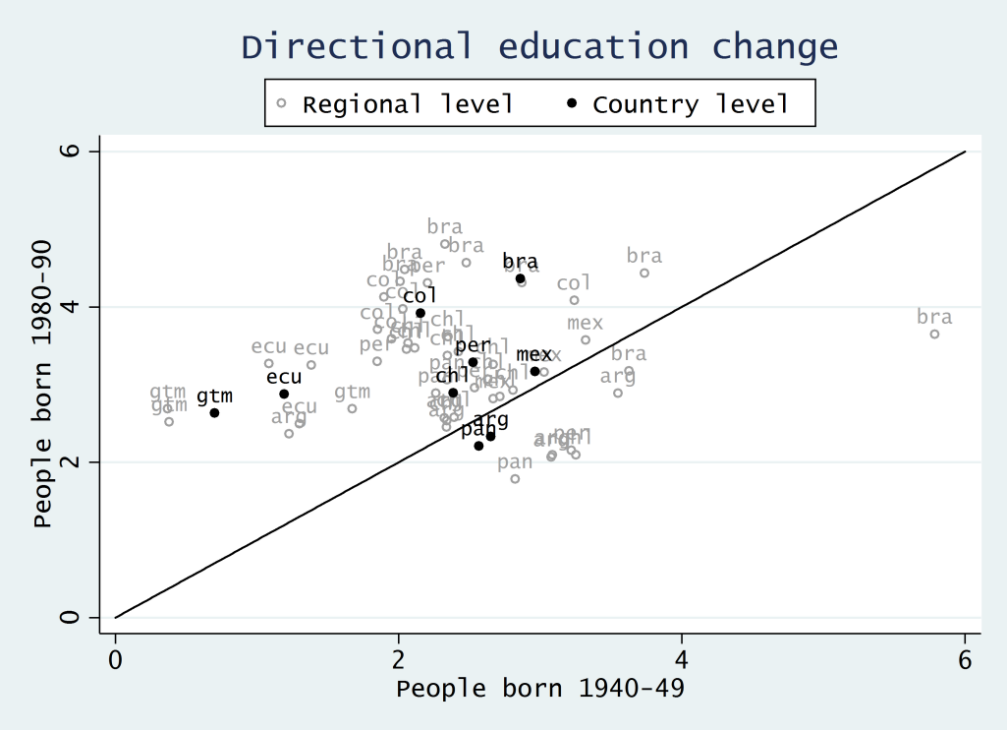


Figure 4. Directional education change. Older and younger cohorts.



In Figure 2 almost every observation in our sample lies below the 45-degree line, indicating that the cohort of children born between 1980 and 1989 experienced higher social mobility compared to people born between 1940 and 1949. On the other hand, Figure 3 shows that the 1980-1989 cohort had more chances to improve their position in the years of education distribution than the 1940-1949 cohort; and, also, for most of the observations that probability became higher than 50% which is higher than the maximum reported for the older cohort. Finally, Figure 4 shows that most of the people born between 1980 and 1989 experienced higher increases in their archived years of education with respect to their parents than people born between 1940 and 1949 did. In general terms, the figures presented above shows that most regions/countries analyzed experienced an improvement in social mobility indicators comparing the younger and the older cohort; being that progress robust to different measures of intergenerational mobility.

Given that the scope of this work is to establish to which extent increasing levels of social mobility might foster economic performance, it is relevant to first analyse the unconditional relationship between those variables. With this purpose, in Figures 5-7 we show the unconditional relationship between mobility and economic performance measured by total income per capita, estimated from household surveys. According to our hypothesis, we expect that intergenerational persistence show a negative relationship with total incomes as long as a closer relationship between children and their parent's educational outcomes could be a detriment to economic growth. On

contrary, we presume that the probability of upward mobility as well as the directional education change between generations are positive related to GPD.

Figure 5. Intergenerational persistence and GDP.

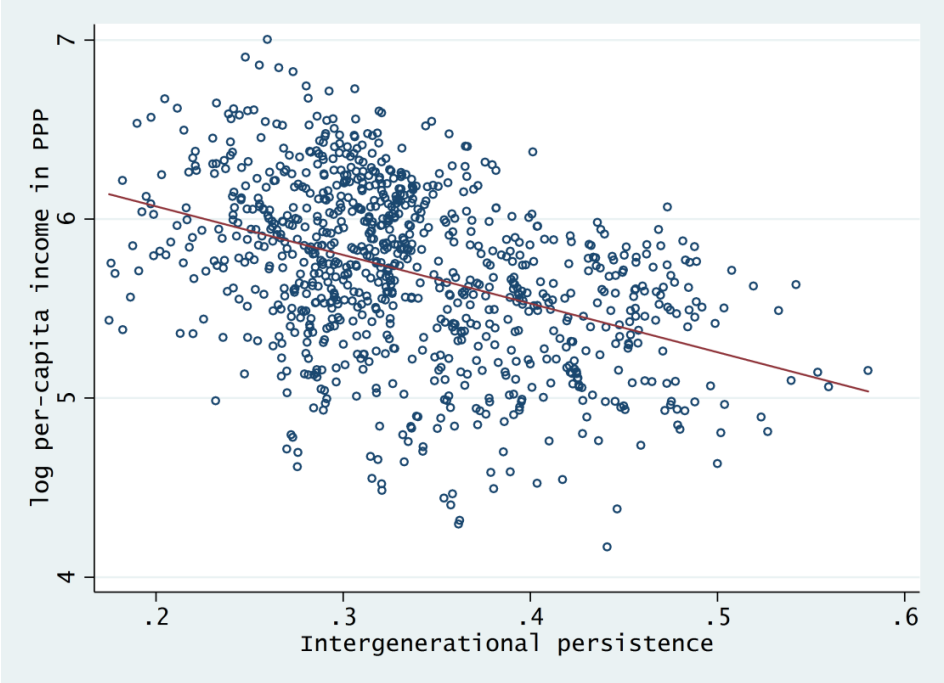


Figure 6. Probability of upward mobility and GDP.

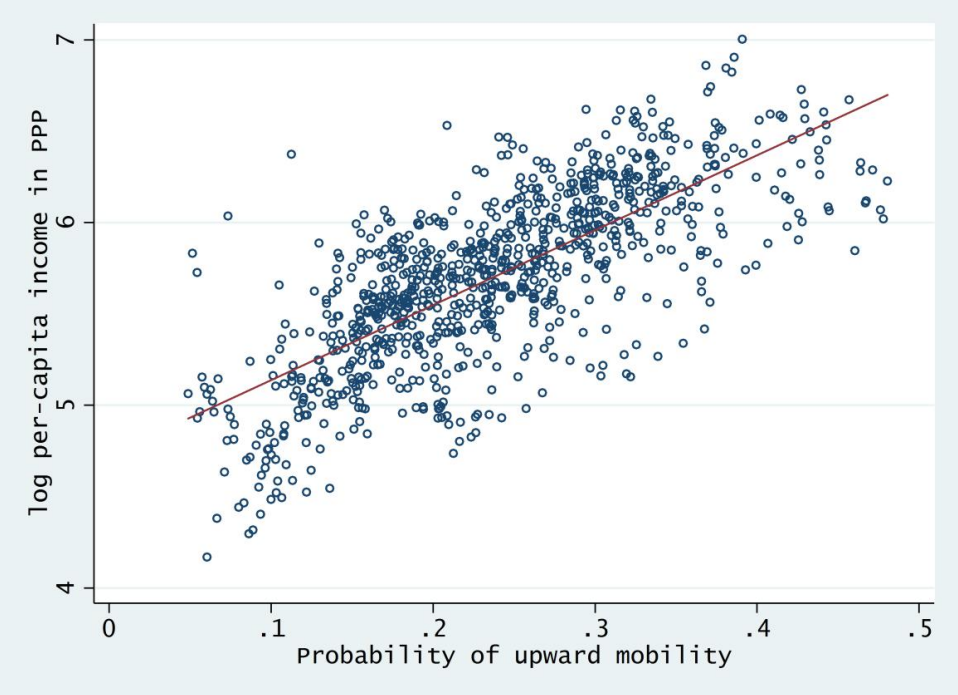
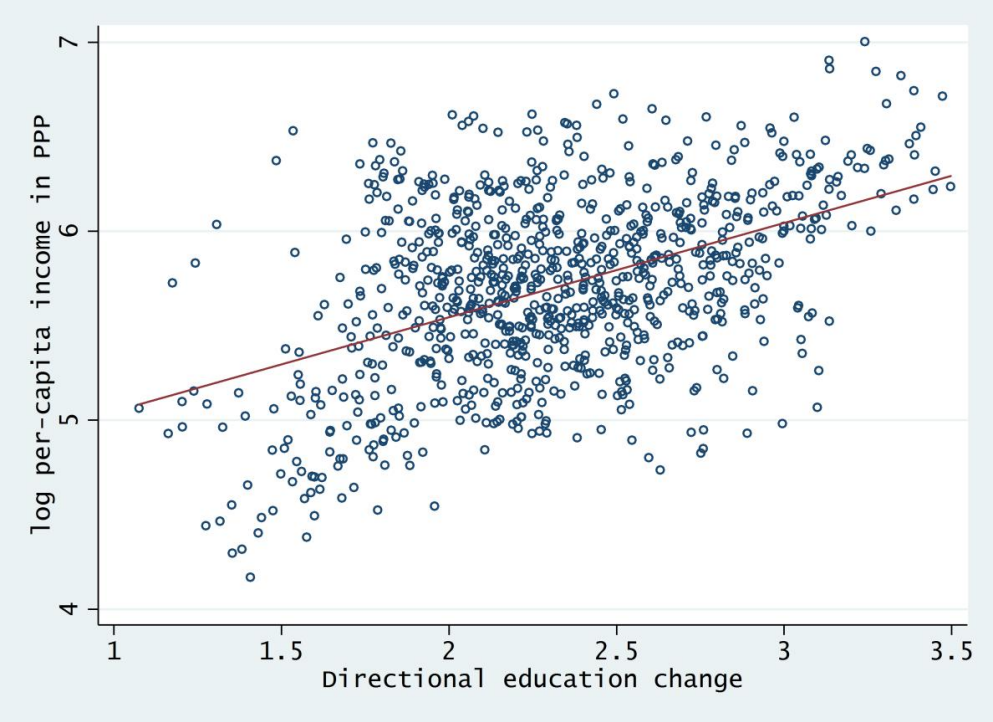


Figure 7. Directional education change and GDP.



The figures show a clear relationship between social mobility indexes and economic performance. Additionally, the unconditional relations between both variables have the expected sign. These descriptive results motivate to perform a deeper analysis. The first step is to estimate the relationship including a set of control variables such as the share of urban population and migrants in the region and indicators for the average degree and variance of education. Table 2 exhibits the main results.

Table 2. Economic performance and social mobility.

Dependent Variable: Total per capita income	Fixed Effects	Difference GMM	System GMM
Intergenerational persistence	**-8.044*** **	**-4.206*** **	**-2.303** **
	(0.591)	(1.439)	(0.910)
Region FE	Yes	-	-
Controls	Yes	Yes	Yes
Observations	886	676	498
Intergenerational correlation	**-7.565*** **	**-1.146**	**-3.461*** **
	(0.892)	(2.197)	(1.029)
Region FE	Yes	-	-
Controls	Yes	Yes	Yes
Observations	886	676	498
Probability of upper class persistence	**-3.603*** **	**0.025**	**-1.787*** **
	(0.869)	(1.700)	(0.429)
Region FE	Yes	-	-
Controls	Yes	Yes	Yes
Observations	886	676	498
Probability of upward mobility	**6.313*** **	**4.493** **	**0.311**
	(0.829)	(2.244)	(0.532)
Region FE	Yes	-	-
Controls	Yes	Yes	Yes
Observations	886	676	498
Average education change	**1.080*** **	**0.726** **	**0.136**
	(0.101)	(0.366)	(0.086)
Region FE	Yes	-	-
Controls	Yes	Yes	Yes
Observations	886	676	498
Directional education change	**0.638*** **	**0.296**	**0.141***
	(0.092)	(0.239)	(0.072)
Region FE	Yes	-	-
Controls	Yes	Yes	Yes
Observations	886	676	498

The results shown in Table 2 are in line with our hypothesis about the positive relationship between social mobility and economic performance. If we focus in the estimates produced by System-GMM models we found the expected results. Estimates suggest that higher levels of both intergenerational persistence and intergenerational correlation as well as a higher probability of upper class persistence can be a detriment to economic growth. On the other side, increases in years of education of children

relative to their parents could be a channel to foster economic prosperity, since coefficients associated to average and directional education change have positive signs, despite the estimates of the first variable are not significative. Additionally, results from Table 2 shows that a higher probability of children born from parents in the bottom of the distribution of years of education to achieve, at least, a secondary school degree, may be also contributing to produce higher levels of GDP.

This preliminary analysis suggests that improvements in social mobility can be a driver of economic performance. Our next steps in this study includes several robustness checks. For example, we are interested in evaluate this relationship using alternative outcome variables such as different income measures from household surveys or satellite data on night lights (Henderson et al, 2012). Additionally, we want to consider more carefully the role of migration within our framework. In this sense, social mobility indexes can be calculated not considering migrant population.

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