ALTERNATIVE MEASURES OF INTERGENERATIONAL SOCIAL MOBILITY IN ARGENTINA

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Abstract

This study analyzes the existence and extent of intergenerational social mobility in Argentina, that is, whether parents’ economic status is transmitted to their children or how much of that status is transmitted.

For this purpose, we estimate three different measures: i) Social Mobility Index (SMI), which measures the importance of family background in determining the education of teenagers, assuming that a smaller schooling gap should imply better future opportunities for young people and that equality of opportunity is a good indicator of social mobility. ii) Siblings Correlation Index, based on the correlation of schooling outcomes between siblings, on the assumption that those children who by their late teens have fallen behind in terms of schooling will have the worst socioeconomic outcomes later in life and iii) Family Background Immobility Index, based on the idea that if schooling has great impact on income and if it is strongly affected by family background, intergenerational correlations in incomes across families will be high and intergenerational social mobility, as measured by intergenerational relative income changes, will be low.

Estimation of intergenerational social mobility in Argentina is a major contribution to this paper. All three measures presented show a mobile society. SMI and Family Background Immobility index indicate no major changes between 1996 and 2002 on a national basis while Siblings Correlation suggest a slight progressive increasing in intergenerational social mobility. Robustness of the last index is doubtful. In Great Buenos Aires, according to SMI results, there seems to be a slight declining between 1981 and 2002. Family Background Index shows a slight decrease in social mobility in 1996, but almost same values in 1981 and 2002.

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1. Introduction

Inequality is widely regarded as one of the main problems facing Latin American countries. Different authors have well established that during the 1990s many countries in this region experienced an increase in income inequality. This is considered a matter of concern as long as societies experience the kind of destructive inequality that inhibits aggregate growth, aggravates consequences of poverty and deepens natural and structural differences between individuals, as well as other several undesirable effects.

However, inequality is sometimes seen as less worrying or as a necessary condition for further growth. It is claimed that high inequality combined with high social mobility is not as bad as high inequality combined with low social mobility. In line arguments suggest that the first scenario provides people with good incentives to work hard, be innovative, and take risks as the expected returns are high while the high inequality-low mobility combination does not provide such incentives. In the latter case, both rich and poor people have few incentives to work hard: those on the top of income distribution because they are born wealthy and will maintain their status whereas those on the bottom will unlikely ascend socially and increase their welfare no matter how much their effort.

The general consensus is that measures of inequality are like snapshots that cannot tell anything about lifetime income or mobility. They just reflect differences in income at a specific point in time, but not whether those at the top or bottom of income distribution are moving up or down or expect to do so. Therefore, they tell us little about what is happening to people’s opportunities and to their well-being over a prolonged period. (Birdsall and Graham, 2000).

A second concern is intergenerational mobility within families or dynasties. A branch of economic literature has developed models where initially, a society is divided in a group of rich and a group of poor people. The first invests in human capital and therefore has higher labor income within skilled formal sector and bequeaths resources to their descendants’ education. With decreasing fertility rates, rich dynasties maintain and perpetuate their status. The second group invests insufficiently in human capital, works in the unskilled sector and generation after generation leaves less inheritance to their children. Greater fertility rates associated with this group helps to uphold poverty conditions. If there is no intergenerational mobility between the two groups nor public policies to promote it, initial distribution of “rich” and “poor”, associated fertility rates and main other variables determine if this society converges to a situation of inequality or more equality.

As mobility provides a better measure of changing opportunities than do traditional measures of inequality, and as understanding mobility is critical to the discussion on inequality and of what to do about it¹, this work analyzes the existence and extent of intergenerational social mobility in Argentina. That is, whether parents’ economic status is transmitted to their children and/or how much of that status is transmitted.

The worsening of labor conditions, as confirmed by the increasing income gap between formal and informal workers, the rise of unemployment rate up until the beginning of 2002, periods of macro and microeconomic instability, the well documented evidence on increasing inequality and apprehension to social consequences in the median and long term, all constitute valuable reasons to support our interest in analyzing the degree of intergenerational social mobility in Argentina in the last two decades.

¹ Birdsall and Graham (2000).
For his purpose, and as a result of being restricted by absence of panel data\(^2\), we calculate three different social mobility indexes: i) Andersen’s (2001) Social Mobility Index (SMI), which measures the importance of family background in determining the education of teenagers concluding that social mobility is low if family background is very important in determining schooling levels. In this sense, social mobility is likely to be correlated with income mobility, given the close and well established connection between education and income. The methodology assumes that a smaller schooling gap should imply better future opportunities for young people and that equality of opportunity is a good indicator of social mobility. ii) Dahan and Gaviria’s (1999) index of social mobility for developing countries, based on the correlation of schooling outcomes between siblings, on the assumption that those children who by their late teens have fallen behind in terms of schooling will have the worst socioeconomic outcomes later in life. iii) Behrman, Birdsall and Székely’s (1998) “Proportional Intergenerational Schooling Mobility Index” which characterizes the extent of intergenerational social mobility. Schooling is thought to be a major mechanism through which intergenerational social mobility is affected. If schooling has great impact on income and if schooling is strongly affected by family background, intergenerational correlations in incomes across families will be high and intergenerational social mobility, as measured by intergenerational relative income changes, will be low. If family background plays a minor role in determining schooling, on the other hand, intergenerational social mobility as indicated by relative intergenerational income movements may be high.

The rest of the work is organized as follows. In Section 3 we discuss the broad concept and measurement of mobility. Section 4 includes a review on international literature as well as the main findings of studies on Argentina. In the next section, we describe background models, data and methodology to estimate the three mobility indices. Prior to implications of the analyses in Section 6, we present estimation results. Finally, we conclude and outline future agenda. Methodological issues and estimation results are offered in Appendix.

2. On the concept and measurement of social mobility

a. Discussing the concept of mobility

While the economic literature on income distribution and economic growth has expanded substantially in the past decade both in theoretical and empirical work, studies of social mobility have primarily been the domain of sociologists, who have focused on developed countries without directly addressing relations among economic growth, economic policy and mobility\(^3\).

According to Fields (2000), despite some basic agreement about the concept of economic mobility, there are also some fundamental disagreements because the term income mobility conjures up very different ideas in people’s minds. He states firmly that the mobility literature is plagued by people talking past one another because one person’s idea of mobility is not another’s.

When discussing mobility issues, Checchi and Dardannoni (2002) distinguish between intergenerational and intragenerational mobility. The first concept concerns the study of how the distribution of some relevant measure of individual status changes between different generations in a given society. Alternatively, intragenerational mobility studies how the distribution of individual status changes among a group of individuals over a given period of their lifetime. The simplest framework to capture either of these aspects is to consider

\(^2\) There are no longitudinal data to analyze income mobility. Nevertheless, pseudo panel data can be constructed upon EHP. See literature review.

\(^3\) For exceptions see Birdsall and Graham (2000), Chapter One.
how, in a society of n individuals, a vector $x=(x_1, \ldots, x_n)$ is transformed into another vector $y=(y_1, \ldots, y_n)$ where $x_i$ denotes the value of a relevant observable indicator of the social and economic status of individual $i$, and $y_i$ denotes its value in the next generation (intergenerational case) or in the next time period (intrigenerational case). Typical variables employed in most mobility studies for measuring socio-economic status are income, consumption, education, and occupational prestige.

Mobility data of the type $(x, y)$ describe the joint distribution of fathers' and sons' statuses in a population, while the vectors $x$ and $y$ describe their marginal distributions (Checchi and Dardannoni, 2002). They contain information about many different aspects of the mobility in a society. For instance, $x$ and $y$ each describe both the average level of status and its dispersion respectively within fathers and sons. Then, it could be said that the marginal distributions contain information of a static nature while mobility concerns how the distribution of fathers' statuses $x$ is transformed into that of the sons $y$. Sociologists have suggested that, when analyzing mobility data, the interplay between the distributions of $x$ and $y$ can be described by two quite different concepts: i) **structural mobility**, which refers to how far apart $x$ is from $y$. In the example given by Checchi and Dardannoni, if a country is experiencing a substantial economic growth, there will be a greater number of high status positions available to sons than there were for fathers, and thus it determines some kind of social change; ii) **exchange mobility** which refers to the positive association between fathers and sons statuses in the society.

For Perry et al (2006), mobility is seen as reflecting the equalization of opportunities, a conception that links to Sen’s concern with capabilities for individual progress and to Roemer’s (1998) about the leveling of “circumstances” lying beyond the control of the individual and yet critically affecting the outcome of his or her efforts. Bénabou and Ok (2001) argue that these greater opportunities engender a greater tolerance for inequality, in some sense formalizing Hirschman’s (1981) famous tunnel allegory where stalled motorists sit patiently watching the next lane of traffic advance, only because they see that as a sign that sooner or later they will move too.

Whether one measures a lot or a little mobility depends in part on precisely what is being measured. Birdsall and Graham (2000) claim that confusion about absolute versus relative mobility is at the heart of confusion about whether certain societies really are mobile. **Absolute mobility** is defined as movements of individuals across a fixed income threshold established in a base year for the population as a whole. By this definition, a large number of people would be considered mobile, regardless of their relative position within a distribution. Factors such as economic growth and the natural tendency of incomes to increase with a person’s age tend to ensure high absolute mobility. **Relative mobility** is defined as individuals’ mobility relative to others, normally for a given age, and will reflect the influence of factors such as education, inheritance and luck.

Behrman (2000) asserts that social mobility is used by social scientists to refer to movements by specific entities between periods in socioeconomics status indicators, and explains each of the words in this statement to construct the concept of social mobility:

i. **Movements** is used to mean both total and relative movements (with the latter often referred to as exchange). There is total mobility, for example, if in a three-person society between two periods, everyone’s income doubles from $(1,2,3)$ to $(2,4,6)$. But there may (depending on the exact definition used) be no relative mobility. Mobility (at least the nonrelative component) in this example is just total income change, and it is not clear what insight is gained by calling such total income change mobility. Also, although total

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4 However, they advise that it is important to notice that there are many ways in which a given vector $y$ can be obtained from another vector $x$. In particular, two hypothetical societies could display the same amount of structural mobility because they have the same marginal distributions, but they could differ in how families interchange their relative positions.

5 The following is taking literally from Behrman (2000).
social mobility has a clear meaning for quantitative indicators such as income, the meaning beyond the relative aspect is not clear for inherently relative indicators such as relative social status within a society. Nevertheless a lot of studies (for example, those on intergenerational occupational mobility) focus on total social mobility, albeit usually with awareness of the relative dimension.

According to the cited author, “there is relative (exchange) mobility if in the same three-person society there is a transfer between two periods from the third to the first person so that income change from (1,2,3) to (3,2,1). Here there is mobility even though total income and income distribution both are the same across the two periods. Thus relative mobility has meaning distinct from income growth and income distribution. The distinction between relative mobility and income distribution hinges on persons being anonymous for the latter but not the former. Therefore the change implies relative social mobility because there has been a marginal change between persons one and three but no change in income distribution because persons one and three have simply exchanged positions in income distribution.”

ii. A second term, periods, may be short relative to individuals’ lives or adulthoods (months, years, quinquenniums) or intergenerational (parents’ versus children’s education, adult earnings, incomes or occupations). For questions relating to fluctuations in a persons’ position in the distribution of earnings or income over the person’s life cycle, annual data may be very informative. But for questions relating to intergenerational mobility, some means of characterizing socioeconomic status over the adulthoods of the relevant generations may be necessary.

iii. Third, socioeconomic status indicators that are most commonly used in empirical studies of social mobility include income, earnings, occupation, education, nature of marital matches, political participation, social participation and social status measures. Whether the indicators used in a particular case are continuous or categorical and, if continuous, are cardinal or ordinal has implications for the type of mobility that can be measured (relative only versus total) and the type of empirical analysis that is undertaken.

iv. Fourth, the specific entities of interest generally are individuals, families or groups, of them identified by demographic or cultural characteristics like gender, birth cohort, race, ethnicity, language, religion and location or such previous behavioral decisions as education, marital status, migration status, number of children, and labor force participation.

As Fields (2000) notes, economic mobility studies are concerned with quantifying the movements of given recipient units through the distribution of economic well-being over time, establishing how dependent one’s current economic position is on one’s past position.

Fields (2000) finds it useful to reserve the term income mobility for the generic concept and to use other specific terms for particular aspects of income mobility. Accordingly, he distinguishes five concepts: i) Time dependence, which measures the extent to which economic well-being in the past determines individuals’ economic well-being at present; ii) Positional movement, which gauges how many quintiles, deciles, centiles, or ranks an individual moves; iii) Share movements, occurring when individuals’ shares of total income change; iv) Symmetric income movement, which arises when individuals’ incomes change and the analyses is concern about the magnitude of these fluctuations but no their direction; v) Directional income movement, which measures the changes in earnings or log earnings in algebraic value, in which income gains and income losses are treated separately;

6 Behrman (2000). He also notes that “there may be change in total income without relative mobility and with no change in income distribution and there may be relative mobility with no total income change and with no change in income distribution. There also may be changes in income distribution with no change in total income –from (1,2,3) to (2,2,2)- but this inherently involves relative mobility. Thus total mobility can be decomposed conceptually between the total income change and the change in relative mobility.”
vi) Mobility as an equalizer of longer term income, which compares the inequality of earnings over two or more periods with the inequality of base-year earnings\(^7\).

According to Bénabou and Ok (2001), equality of opportunity provides a very natural approach to the evaluation of mobility processes, so natural that there is in fact no need for special concepts or indices to measure it. One cares about mobility not because income movements are intrinsically valuable, but primarily because of the view -or the hope- that it helps attenuate the effects of disparities in initial endowments or social origins, on future income prospects. From this view of mobility as an equalizer of opportunities (but not necessarily of outcomes), it follows quite naturally that one should measure it precisely by the extent to which it achieves such leveling.

Before suggesting other reasons for analyzing social mobility, we will disentangle the relationship between mobility, inequality, and poverty, as they are logically distinct concepts, and one does not imply anything about the other. For this purpose, we will use an example that belongs to Fields and Sanchez Puerta (2005). The authors first consider the relationship between mobility and inequality. Suppose we have an economy that consists of two individuals whose initial incomes are $1 and $5 respectively. Write this as the vector (1,5).

Suppose that the economy does not grow, so that later the anonymous income distribution remains (1,5). Clearly, inequality is unchanged. But has there been mobility? With anonymous data, which typical cross-sections are, we simply cannot tell. There are, however, two underlying possibilities: denoting the two individuals by \(\alpha\) and \(\beta\), the underlying pattern for named individuals is either:

i) \((\alpha, \beta)\): (1,5) becoming (1,5) or
ii) \((\alpha, \beta)\): (1,5) becoming (5,1).

In case i), there has been no income mobility, while in the second case there has been. Yet in both cases, inequality is unchanged. This exemplifies how mobility and inequality are distinct concepts.

Next, they consider the relationship between mobility and poverty. The distributional changes: i) \((\alpha, \beta)\): (1,5) becoming (2,5) and iii) \((\alpha, \beta)\): (1,5) becoming (1,6), both exhibit upward mobility. If, as is reasonable in this example, we take the poverty line to be somewhere between $1 and $5, poverty measures that are sensitive to income gains among the poor such as the P\(\alpha\) class for \(\alpha > 0\) (Foster, Greer, and Thorbecke, 1984) and the Sen poverty index (Sen, 1966) show a fall in poverty in case i) and not in case iii). This example demonstrates that mobility and poverty are distinct concepts.

Finally, they consider the relationship between inequality and poverty. Suppose the pattern of distributional change is such that the poorer person’s income doubles while the richer person’s income triples: iv): \((\alpha, \beta)\): (1, 5) becoming (2, 15). Because the poor person’s income has risen, poverty again falls (unless the poverty line is above $2 and the poverty headcount is used). Yet, Lorenz curves and all Lorenz-consistent inequality measures such as the Gini coefficient register an increase in inequality. This example shows that inequality and poverty are not the same thing.

The possible grounds for arguing that in addition to total income and income distribution relative social mobility is important, include a series of arguments well established by Behrman (2000), some of which also relate to overall social mobility. As long-run income is likely to be distributed more equally than one-period income, social mobility is desirable not per se but to the extent it provides information about income distribution over a longer period than can be observed in the data. A second argument is that if there exists stochastic elements in innate abilities or preferences that affect marginal prices which determine relative social standing, social mobility by many indicators is likely to be greater, all other things being equal. This does not mean that social mobility is good or bad in itself, but only that measured mobility will be greater in the presence of these factors. Third, if there are greater changes in the value to society of different abilities or preferences because of

\(^7\) Last category appears in Fields and Sanchez Puerta (2005).
technological change, new discoveries, disasters, etc, social mobility by many indicators is likely to be greater, which, again, is not good or bad in itself. It means that some social mobility is likely to reflect better adjustment capacity to shocks than no social mobility. Also, social mobility is important because greater social mobility is likely to imply greater efficiency and productivity through more efficient transactions. Another argument is that as people perceive that society is fairer when there is greater relative social mobility, social mobility may be related to increasing social and political cohesion or greater political support for the system from those in the lower part of the distribution.

Friedman (1962) declares that a given extent of income inequality in a rigid system in which each family stays in the same position in each period may be a greater cause for concern than the same degree of income inequality due to great mobility and dynamic change associated with equality of opportunity.

Solon (2002) argues that international studies of the extent to which economic status is passed from one generation to the next are important for at least two reasons. First, each study of a particular country characterizes an important feature of that country’s income inequality. Second, comparisons of intergenerational mobility across countries may yield valuable clues about how incomes status is transmitted across generations and why the strength of that intergenerational transmission varies across countries.

Sometimes, social mobility has direct effects on welfare while other times it reflects measurement problems more than the fact that relative social mobility is per se directly good or bad. How mobility is conceived and how it is measured make an important difference. Having characterized the concept, we next briefly present different mobility measures emphasizing on data requirements and measurement errors.

b. How to measure social mobility

Fields (2000) warns that it makes a difference in theory which approach is used to gauge mobility because the different approaches make fundamentally different judgments about certain key aspects of mobility. How social mobility has been modeled and measured has varied depending on aspects of social mobility that are discussed in Fields (2000) and Behrman (2000), as well as the available data.

According to Fields and Sanchez Puerta (2005), mobility studies are of two types: i). micromobility studies, which relate the change in a measure of economic well-being to a number of explanatory variables. ii) macromobility studies, that gauge how much mobility there is in an economy as a whole, often comparing differences in aggregate mobility over time or for different groups. In the former, the measure of economic well-being is either the labor market earnings of an individual, changes in total income, log-income, consumption of a household—in per-capita or adult-equivalent basis—or changes in economic position—such as decile or quintile-. The explanatory variables used include base-year income, education, gender, sector of employment, and other time-varying and time-invariant characteristics. In turn, macro-mobility is like macro-growth (how much economic growth an economy has in aggregate), macro-unemployment (how much unemployment an economy has in aggregate), and macro-poverty (how much poverty an economy has in aggregate.)

Mobility analysis follows given economic units through time. Consequently, longitudinal (or panel) data are required for research, which makes mobility analysis different from the measurement of poverty, inequality or economic well-being. Noteworthy, any aspect of economic well-being can be used: income, earnings, expenditures or occupational attainment of the individual or household (Fields, 2000). Other mobility studies assess mobility by looking at economic position in each of T years.

When using aggregated data, one of the empirical tools that facilitates measurement of time dependence is an intertemporal transition matrix, where the rows are the income
classes (either income categories or quantiles) of income recipients in the base year and the columns are the corresponding income classes in the final year. It is a common method used to quantify the movements of people or households across time into the well-being distribution which allows to establish the probability that an individual moves from rank i to rank j. However, this construction of matrices requires longitudinal data. Additionally, transition matrices permits an estimation of the probability of moving inside the aggregated income distribution is the same for all the people or on the contrary, only for certain groups of people or families.

Following Fields (2000), a commonly used measure of income mobility is the ordinary (Person) coefficient of correlation between base year income and final year income. A related measure of income mobility is the rank correlation coefficient. In the study of positional movement, the measure of economic well-being is the individual’s position in the income distribution and the most commonly used measures of economic position are individuals’ quintiles or deciles in the income distribution. For the author, the reason why this kind of analysis is so popular is the fact that movements among positions are the way most analysts think about mobility.8

A different approach to analyze economic mobility consists in exploring intergenerational mobility, that is, whether parents’ economic status is transmitted to their children or how much of that status is transmitted. The concern about the transmission of the socioeconomic status is based on the extent and kind of equality of opportunities that would occur if heritability were an important fact within a society. In other words, the level of intergenerational mobility is seen by many as a measure of the extent of equality of economic opportunity. In this focus, mobility is estimated in a longer temporal dimension because it involves successive generations of people. The most common strategy for measuring the degree of intergenerational mobility is studying the correlation of a generation’s well-being with that of its progeny. Often, is measured as \((1-\beta)\) where \(\beta\) is the estimated coefficient (or elasticity) in a OLS regression of child’s log economic status (earnings or income) on the same measure of his parents’ status, controlling for both son’s and father’s age (Perry et al, 2006).

However, this kind of estimation encounters many obstacles since it requires longitudinal data to match parents and children across time or at least estimation of cross-sectional relations that pertain to aspects of social mobility.

According to Solon (2002), although data limitations forced some early studies of intergenerational mobility to rely on single-year measures of father’s earnings -because of both response error and genuine transitory fluctuations in earnings-, single-year measures are error-ridden proxies for longer-run earnings that tend to underestimate . A partial solution to this is to create multiyear measures of the father’s earnings. When measuring the son’s earnings, a different problem arises. Intergenerational mobility turns out to be small when son’s earnings are measured near the very beginning of his career and larger when measured further along in the life cycle.9

Also, while using a single-year measure as a proxy for longer-run earnings is likely to induce a substantial downward errors-in-variables bias, the two-stage procedure that uses education, occupation or social class to predict father’s earnings is likely to lead to an upward bias. The problem is that the father’s education, occupation and social class are not only

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8 Theoretical derivation of various measures of mobility can be found in Behrman (2000) and Fields (2000).
9 Taking Solon’s (2002) explanation literally, “This pattern arises because the measurement error in son’s early earnings as a proxy for this long-run earnings is not of the classical textbook variety. As explained by Bound et. Al. (1994), mean-reverting measurement error in a regression’s dependent variable compresses its variation and consequently leads to a tendency to underestimate the magnitude of the regression’s slope coefficient. Because of this issue, some of the same researchers who have used multiyear measures of father’s earnings have chosen to measure son’s earnings in only the latest available year. Averaging son’s earnings over multiple years sometimes would require averaging in observations from too early in his career and therefore would worsen the downward bias in the estimation of the intergenerational elasticity in long-run earnings.
correlated with the father’s earnings, but also might be positive predictors of son’s earnings even after conditioning on father’s long-run earnings. In the second-stage regression, when father’s education, occupation or social class is used only to predict father’s earnings, but not as a separate explanatory variable in its own right, the resulting omitted-variables bias may lead to overestimation of the intergenerational earnings elasticity. (Solon, 2002).

Unfortunately, this extended methodology to measure intergenerational mobility requires longitudinal household data that follow households and the individuals in them over time. Such data are really wanted to address the questions of interest on social mobility. However, as regards data availability in Latin America, except for revolving panels of households in labor force surveys, the region lacks of panel or of long enough ones. There are a very few exceptions in which longer panels exists, like Peru. Particularly, in the case of Argentina, there is currently no longitudinal household data, except for the two-year-panel that can be built on its household survey, EPH.

When panel data are not available and tracking people or their income over time is not possible, or when the length of those panels is so short that it is impossible to analyze mobility during people’s lifetime, there is an alternative way which uses cohorts of people selected through random sampling from different surveys and builds pseudo-panels with them. This has many advantages due to the temporal length of the analysis, international comparison and to the fact that the common problems associated with measurement errors and sample attrition can be avoided.

In general, the focus of studies on Latin American countries has been on education because of the greater reliability of the measure and the apparent consensus that education is the critical driver of intergenerational mobility (Perry et al, 2006). Schooling is thought to be a major mechanism through which intergenerational social mobility is affected. If schooling has great impact on income and if schooling is strongly affected by family background, intergenerational correlation in incomes across families will be high and intergenerational social mobility as measured by intergenerational relative income changes will be low. If family background plays a minor role in determining schooling, on the other hand, intergenerational social mobility as indicated by relative intergenerational income movements may be high (Birdsall, Behrman and Székely, 1999). This argument supports our empirical research in section 5.

3. Empirical Review

a. Review on empirical international results

Literature review in this section includes various studies that address patterns of income mobility, labor mobility and educational mobility. There is also a significant literature on behavioral models of intergenerational relations, human resource investments, and marriage as it relates to social mobility. Some studies of intergenerational relations and human resource investments address how family background affects socioeconomic success of children through channels such as genetic endowment and investment in children’s education. Besides, there is an extensive literature on the nature of marriage choices and on how marriages may affect or reflect social mobility. Additionally, literature on child labor, determinants of children’s grade attainment and the relationship between children’s educational attainment and household income are briefly review as they play a key role in explaining the association of family background and schooling.

Atkinson et al. (1992) survey empirical studies on earnings and income micro-mobility. Solon (2002) summarizes the evidence on intergenerational mobility in Canada, Finland, Germany, Malaysia, South Africa, Sweden and the United Kingdom. His review focuses on estimates of the elasticity of son’s earnings with respect to father’s earnings. In
most of the studies, the estimated elasticity comes from OLS of a log-linear regression of son’s earnings on father’s earnings with age controls for both generations.

The study of mobility patterns in developing countries’ labor markets is a recent area of research due to the lack of panel data surveys. Baulch and Hoddinott (2000) and Fields (2001) review the developing country literature on the subject. In a way, occupational mobility can be considered a good indicator of development. Cited by De Ferranti et al (2003), for Pero (2003) mobility can result from “economic growth and its impacts on job creation and on sectoral and occupational composition and demographic aspects” and be a consequence of “distribution of opportunities”.

For Behrman and Knowles (1997) schooling is widely seen as critical for income generation in all types of economies. A growing concern among many has been the possibility of increasing inequality in part due to children from higher-income households obtaining more schooling and reaping greater gains from schooling than children from lower-income households. There are many empirical studies for various societies that tend to find significantly positive, but small associations between household income and schooling.

These studies generally have three major limitations if our the purpose is to characterize the degree of association between household income and schooling-related investment: i) use of income indicators that may be contaminated by relatively large measurement errors and endogeneity; ii) inclusion of other household, community and schooling variables that may represent part of the association with income in empirical estimates; iii) the use of limited indicators of schooling.

Much of this literature extends Becker’s (1964), Ben-Porath’s (1967), and Heckman’s (1976) early work on dynamic models of human capital investment, reviewed in Duryea (1998). Typically in investment models of schooling, parents can borrow against future earnings to finance investment in children’s education. Investment in education occurs at young ages when children’s opportunity costs are the lowest. The dual assumptions of perfect capital markets and perfect foresight imply that the optimal consumption and investment paths are fully separable. According to Becker and Tomes (1979), low income parents invest as much in their children's education as high income parents. However if borrowing constraints are binding or access to credit varies by parents’ income level then the separability of the consumption and investment decisions breaks down and parents’ permanent income may affect investment in children’s schooling.

In line with Rosenweig and Evenson (1977) and Gullason (1989), consumption models of education predict a positive effect of parents’ permanent income on children’s educational attainment even in the absence of credit constraints. The schooling of a child is a normal good which varies positively with parents’ income.

A positive empirical relationship between educational attainment and father’s income estimated from cross-sectional data as in Psacharopoulos and Arriagada (1989) and Levison (1991) may arise from unobserved heterogeneity. For example, unobserved tastes for education may be correlated with father’s income. Duryea (1998) states that although many studies show a positive correlation of income and educational attainment, static approaches are flawed since the current stock of human capital is a function of past decisions about education.

Another strand of literature examines the effects of income shocks on households and suggests a link between transitory shocks to income and school achievement. Duryea (1998) examines the role of transitory shocks to household income in children’s advancement through school in Brazil. She measures whether or not a child gains a year of schooling from one year to the next when controlling for parents education and initial earnings. Her findings suggest a 4 percent decline in the probability of grade advancement for children 10-15 whose father has experienced an unemployment shock during the school year. These results demonstrate that children’s time is used to buffer rare transitory income
shocks to households in ways that are consistent with education models that incorporate assumptions of imperfect credit markets.

According to Lam and Shoeni (1993), research on the role of family background in explaining earnings and returns to schooling is less extensive for developing countries. Behrman and Wolfe (1974) identified strong independent effects of family background in a study of female earnings in Nicaragua. Using a sample of 500 Nicaraguan sister pairs, they difference the data across siblings and find that returns to schooling drop from 11.4 percent to 8.6 percent, leading them to conclude that standard estimates of returns to schooling are biased upward in the absence of controls for family background and unobserved ability. Heckman and Hotz (1986) estimate earnings equations for Panamanian males that include father's and mother's education as regressors. Parental education is found to have a significant direct effect on earnings. Lam and Shoeni (1993) analyze the effects of family background on male labor market earnings in Brazil. They attempt to identify the magnitude of the "family background bias" in conventional estimates of returns to schooling and to identify the direct effect of family background on earnings.

Although schooling is associated with high private rates of return in the labor market, including higher wages and lower unemployment as well as other positive outcomes such as lower infant and child mortality rates, levels of schooling attainment remain low in developing countries. The positive relationship between children's educational attainment and household income is a well established empirical regularity. The stylized facts are consistent with a variety of economic models of education, including models which incorporate incomplete capital markets.

Côrtes Neri et al (2005) note that Jacoby and Skoufias (1997, 1998) link incompleteness in financial markets to lower human capital accumulation in a study examining the response of children's school attendance to seasonal fluctuations in the income of agrarian households in rural India. They find that children's time is used as a buffer or a form of self-insurance for unforeseen income losses. Lacking information on children's schooling attainment they are unable to estimate the actual effect on children's achievement in school. Flug et al. (1998) found that areas without financial markets had lower secondary enrollment rates. Parker and Skoufias (2002) found that increased unemployment rates significantly increased the probability of child drop-out in Mexico. Beegle et al (2002) and Edmonds (2002) find consistent results for Tanzania and South Africa, respectively.

Côrtes Neri et al (2000) observe that father's income has a significant positive correlation with child's dropping out of school and of repeating a grade but their findings do not suggest a significant relationship between a father becoming unemployed and a child entering the non-domestic labor market. However, the results demonstrate a significant positive relationship between a father becoming unemployed and a child beginning to work in domestic labor. There was also a positive correlation between father becoming unemployed and a child dropping out and repeating a grade. Both gender and age were highly significant with boys and older children being more likely to work, drop-out and repeat grades.

The study of Côrtes Neri et al (2005) confirms a strong positive correlation between household income status and the probabilities of labor market entry and school drop-out. Their findings suggest that income support programs can improve schooling outcomes for poor children. Wealthier households appear able to self-insure against temporary income shocks caused by unemployment of the head. In the poorest households, however, loss of

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10 An important econometric consideration is that the inclusion of those variables that are correlated with a worker's schooling may increase measurement error bias in the earnings equation, an effect emphasized by Welch (1975) and Griliches (1977).
13 For more detail, see Côrtes Neri et al (2005)
earnings by the household head increases the probability of drop-out and labor market entry, and also increases the likelihood of nonpromotion. This is consistent with the presumption that the poorest households may be credit-constrained and will use child labor to smooth adverse income shocks. The authors find some evidence that the adverse consequences of transitory income shocks have permanent adverse consequences for child schooling. The probability of drop-out and labor market entry increases once a child begins to lag behind in school. Consequently, to the extent that loss of earnings of the head leads to nonpromotion among children in the poorest households, there is a longer-term increased probability that the child will exit school at a young age and start working.

Dureya et al (2001) analyze employment and schooling patterns of urban Brazilian children and youth from 1982 to 1998 using data from Brazil's Monthly Employment Survey (PME). They document substantial declines in the proportion of boys and girls who are working in the 1990s. They estimate bivariate probit regressions in order to analyze the extent to which economic shocks to the household affect both labor force entry and grade advancement of children and find that the male household head becoming unemployed tends to increase the probability of labor force entry and decrease the probability of grade advancement for girls age 10-14, although the magnitude of the effects are relatively small. The estimated effects for boys are even smaller and not statistically significant. The results suggest that children's time allocation to work and school are not a major source of adjustment by households to short-run economic shocks, although there do appear to be negative effects on girls.

It is often postulated that educational attainment of parents plays a key role in determining children’s labor activities. Educated parents are likely to have higher incomes and are thus more likely to be able to send their children to school. Furthermore, highly educated parents are expected to dissuade children from engaging in labor activity because they realize the importance of education, in particular, the long-term (monetary) returns to human capital accumulation (Dar et al, 2002). It is well-documented that parents’ educational attainment is strongly associated with children’s school attendance. This claim is supported by much of the empirical literature on the economics of education, and these results have been summarize by Dar et al (2002).

De Ferranti et al (2003) stress that educational levels of individuals and their parents are highly correlated, in the sense that sons of parents with little education would also have little education. According to Barros and others (2001), the schooling of parents appears to be the most important variable to explain educational performance in Brazil. Moreover, the schooling of mothers seems to have a stronger effect than that of fathers on educational performance.

As cited by Côrtes Neri et al (2000), the literature examining child labor is quite extensive including studies by Jensen and Nielsen (1997), Psacharaopoulos (1997), Tzannatos (1998), and Grootaert and Patrinos (1999). Most of these studies examine household characteristics such as poverty and educational attainment of parents as determinants of child labor. The empirical evidence from this literature demonstrates convincingly that poverty and child labor are closely related and that child labor impedes the educational attainment of working children. The recent works of Paes de Barros and Lam (1996), Gomes-Neto and Hanushek (1994), and Lam and Schoeni (1993) analyze the determinants of children’s grade attainment and achievement (or their lack thereof). Mello, Souza and Silva (1996) find that repetition rates for the first two years of schooling are negatively related to parents’ income level using retrospective data for São Paulo, Brazil in 1982.

Solon’s (2004) model emphasizes the role of education in generating intergenerational persistence, showing that the relationship between parental income
and sons’ human capital and the returns to human capital both have crucial parts to play in the transmission of economic status between generations\textsuperscript{14}.

Since the idea of intragenerational short-term mobility is strongly related to volatility—or at least the two concepts are not easily separable—the literature usually focuses more on intergenerational long-term mobility. The main variables used in this kind of analysis are generally assets or choices related to education and occupation, which can be good proxies for permanent income.\textsuperscript{15}

\textbf{b. Review of empirical studies on Argentina}

Even though the present study focuses on intergenerational mobility, the aim of this section is to review main findings on income mobility and occupational mobility in Argentina in order to provide a comprehensive investigation related to overall mobility\textsuperscript{16}. Research on income mobility is recent and has been growing due to availability of new data from panel surveys. The major preceding studies include those by Wodon (2001), Menéndez and Albornoz (2004), Fields and Sanchez Puerta (2005), Fields et al (2005), Navarro (2005) and Beccaria and Groisman (2005).

Wodon (2001) analyses income macromobility and measures the magnitude of the income risks faced by urban workers in Argentina and Mexico during the business cycle. He uses a new measure of mobility, namely the Gini index of mobility, and finds evidence that there has been no increase in labor income mobility over time in Argentina and Mexico from the late 1980s to the second half of the 1990s\textsuperscript{17}. He concludes that mobility and the associated income risk appear to be negatively correlated with growth in Argentina. Even though the author focuses on the different patterns of mobility in periods of growth and recession, he does not analyze the relationship between earnings change and initial earnings or other measures of initial advantage of the individuals as explanatory variables of income dynamics in Argentina (Fields and Sanchez Puerta, 2005.).

Menéndez and Albornoz (2004) analyze income mobility and inequality during different economic shocks in Argentina in the 1990’s using five one-year panels. They make use of the directional income movement measure “changes in log family income” following the work of Fields et al. (2001). Furthermore, they analyze the relationship between mobility and the trends in cross-sectional inequality using Galton’s (1889) statistical model that relates final year income to base year income. They observe that in some periods it is possible to find progressive income mobility and a regressing income distribution.

Analyzing mean mobility by income quintiles, they find that, in spite of the fact that most of the upwardly mobile individuals belong to the lowest quintiles (at a decreasing rate over time), the new lowest quintile comers (people leapfrogged by the first quintile upwardly mobile) suffered negative mobility throughout the whole period. Additionally the immobile individuals of the lowest quintile have not only suffered negative income mobility but have

\textsuperscript{14} Blanden 2005  
\textsuperscript{15} De Ferranti et al (2003).  
\textsuperscript{16} The approach of occupational mobility studies the probability to transit between being employed, unemployed or inactive for a worker. In spite, labor income mobility analyzes fluctuation in wages over time.  
\textsuperscript{17} The Gini index of mobility is a function of ranks of individuals in the overall distribution of income. According to Wodon (2001), the advantage of the index is that it takes into account both the level of income of the individuals and their ranking in the distribution of income, with the changes in rankings which traditionally define mobility being weighted by the changes in income levels through the covariance formula. Because the Gini index of mobility is directly related to the Gini index of inequality, it provides a measure of relative rather than absolute risk. In the same way that the Gini index of inequality is intimately related to relative deprivation theory, the Gini index of mobility measures how much people are affected by income shocks not only in absolute terms, but also in relation to others through changes in their position in the distribution of income.
done so at an increasing rate throughout the decade. While the lowest quintile is becoming poorer over time, the inverse is observed for the richest quintile.

To analyze the apparent inconsistency -that although the poorer individuals were the ones that suffered the greatest positives changes in their incomes, inequality between 1991-2000 grew instead of diminished- the authors model the dynamic variability of incomes based on Galton’s model and test his predictions constructing one-year panels. They find three structural facts regarding the income dynamics: i) there is regression to the mean, which diminishes when predicted incomes are used instead of recorded ones. Initial incomes are more relevant towards the end of the nineties than during the beginning so it seems mobility has been less progressive at the end of the decade in Argentina; ii) they detect that transition to and from null incomes were important elements in the observed regression to the mean; iii) there is an asymmetric behavior between the extremes of the distribution, where the poorer who did not move becomes more poor. (Navarro, 2005).

To Albornoz and Menendez (2004), it seems that the observed short-run pro-poor income mobility in Argentina during the nineties has not assured a more equitable society, at least in the medium-term. And indeed, during this period Argentinean society has become less mobile as a whole.

Fields and Sanchez Puerta (2005a) study earnings mobility in Argentina during macroeconomic growth and contractions of 1996-2005 and address the distributional consequences of these events. Using seven one-year panels of individual workers in twenty-eight cities, they examine the change in labor market earnings for the same individuals, both in an unconditional way in a univariate framework and in a conditional way using multiple regression. They conclude that when analyzing their panel data, the pattern of changes is much more progressive than would appear from the standard cross-sectional analysis. They find that both in positive and in negative growth periods, those who start in the least advantaged positions enjoy the most positive changes in pesos, not just in percentages, a finding contrary to the view held by many that the poor are the big losers in recessions. Furthermore, those who gain the most when the economy is growing are also those who gain the most or lose the least when the economy is contracting. That is to say, the pattern of change is structural and not symmetric.

Fields and Sánchez Puerta (2005b)18 explore who were the ones that took advantage of the prosperity years and who were the ones that lost more during the crisis. To this end, they tested different hypothesis regarding income dynamics during the years 1996-2003. Their main results corroborate the structural convergent hypothesis, that is to say those with larger incomes declared at the beginning of the period suffered the worst changes both in the blooming years and in the recession ones. Regarding the variables that explain mobility, they found that the variable “income at the base period” is the only economically and statistically significant (Navarro, 2005). Also, Fields et al (2005) find that results using predicted earnings confirm the results using initial reported earnings: divergence19 is rejected in favor of convergence.


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19 This hypothesis holds that in any given year, those individuals for whom base-year earnings level is highest are those who experience the largest earnings gains or the smallest earnings losses.
incomes is found to be very high in Argentina, suggesting that the high level of inequality found in the cross-section will not persist over time. The paper also finds conditional mobility high.

Results show substantive long term income mobility in Argentina indicating that the income path does converge into the average income. The estimation stresses the fact that the convergence of incomes exists around the individual characteristics as well as in general terms. Mobility remarkably rises as the temporal framework grows, and the convergence to the mean income accelerates in a biannual comparison showing reversion in the income distribution when the temporal framework extends up to five years.

Noteworthy, there is a greater literature on occupational mobility. Although based on data on Gran Buenos Aires most of the times, traditional studies include those by Germani (1963), Beccaria (1969) and more recently, Jorrat (1987, 1992, 1997, 1998, 2000), Becarria and Maurizio (2003), Gutierrez (2004).

Jorrat (2000) uses a national sample of 2002 and 2003 including 1642 observations containing information on the occupation of the interviewed and of his father to study occupational mobility. He concludes that the Argentine crisis of 2001, did not apparently changed historical mobility patterns.

Beccaria and Maurizio (2003) use duration models to analyze characteristics of labor mobility in Gran Buenos Aires and find that there was a non homogeneous increase in such mobility among different groups. Beccaria and Maurizio (2005), focus on transitions from jobs again. They compare exit rates and use duration models to evaluate the importance that certain variables may have on the probability of leaving the occupation. Their results suggest that mobility did not change for covered private employees, nor men or women, whereas it grew for non-registered wage-earners and non-wage-earners.

Gutierrez (2004) focuses on occupational and wage mobility in urban Argentina in the period 1998-2002. He constructs panels for all individuals (including the inactive) using the EPH. He studies the determinants of wage mobility using the concept of time independence - the correlation coefficient between wages at two different points in time- and the determinants of finding or losing a job. He finds that low-earnings individuals have more wage volatility and more movements into and out of employment while high-earnings workers show little occupational mobility. Furthermore, men, the least educated, and younger individuals show more wage and occupational mobility. Instead, it is probable that more educated women will become unemployed.

Recently, there have been increasing efforts to measure actual or perceived social mobility and changes in mobility both across generations and within generations in Latin America. Although limited by the availability of longitudinal data some of the recent studies have based their estimates on cross-sectional data, with focus on intergenerational mobility in schooling. In particular, Behrman, Birdsall and Székely (2000), Dahan and Gaviria (1999) and Andersen (2001) have used multiple household surveys to assess the extent of intergenerational schooling mobility and to construct indexes of intergenerational social mobility.

As the aforementioned studies all present results specifically for Argentina, they constitute the background models of this paper and are presented in the next section.

4. Estimation of intergenerational social mobility in Argentina

a. Background model

Three papers from the Inter-American Development Bank have calculated social mobility indices for Latin American countries using household surveys: Behrman, Birdsall and Székely (2000), Dahan and Gaviria (1999) and Andersen (2001). The main idea behind them
is that given the close connection between education and income on one hand and between parent’s investment decisions and educational attainment of their offspring\textsuperscript{20} on the other, schooling gap is a very simple indicator of future opportunities. In turn, equality of opportunity is a good indicator of social mobility. The stronger the associations between household income and child schooling, the lower the intergenerational social mobility and the less equal the opportunity.

Before turning to a description of their methodology and our own data report and main findings, we discuss briefly why schooling might be associated with household income.

The argument is that if there were no unobserved differences between low- and high-income households; and if schooling were purely an investment made in perfect markets where same prices prevailed, then, there would be no differences in schooling investments associated with income, after having controlled for any observed differences in household characteristics. Put simply, educational attainment of children would be independent of their households’ socioeconomic characteristics. It doesn't matter whether a child comes from a “poor” or “wealthy” family because their educational performance would be the same\textsuperscript{21}.

Instead, there might be associations between household income and investments in schooling because household income i) is correlated with unobserved determinants of child schooling, such as innate ability, preferences, and family connections; ii) household income serves as a proxy for price variations in school inputs; iii) and household income plays a causal role in the presence of imperfect markets\textsuperscript{22}.

According to Behrman and Knowles (1999) and Bherman, Birdsall and Székely (1998), Becker’s (1967) Woytinsky lecture on the determinants of human capital investments provides a point of departure for the analysis of possible associations between parental household income and schooling investments\textsuperscript{23}. Within this framework, schooling investments are made until the private marginal benefits of the investment equal its private marginal costs. If all markets function perfectly, there are no government interventions, and schooling is only an investment, then everyone invests in schooling until the expected rate of return from schooling equals the expected rate of return on alternative investments (point of efficiency E), regardless of household income. In this case there are very few or no channels through which income may be associated with schooling.

But if marginal private benefits for human capital are associated with household income, private incentives to invest are more than E. Given the range of real-world market imperfections and government interventions, there are many reasons why high-income households with highly educated parents may be associated with higher marginal private benefits and lower costs of schooling investments, even if schooling is purely an investment\textsuperscript{24}. In other words, higher-income households have private incentives to make greater investment in the schooling of otherwise equal children because they are better able to manage market imperfections or because they have unobserved characteristics that increase schooling investments and that are associated with household income\textsuperscript{25}.

\textsuperscript{20} Behrman and Knowles (1997) review 42 studies covering 21 countries where estimates for about three-fifths of the schooling indicators used show significant associations between household income and schooling.

\textsuperscript{21}Inherited natural abilities, genetic endowments and preferences for studying are not being considered in this simplified argument.

\textsuperscript{22} In addition to the investment aspect of schooling, spending time in school may be a current consumption activity that is associated with household income that. If considered like a normal good, ceteris paribus, more household income leads to more schooling for that reason alone. (Behrman and Knowles, 1999).

\textsuperscript{23} Other theoretical models on the same line are useful. Noteworthy, a simple three-period variant of the Ben-Porath’s (1967) model can be used to analyse impact of household income shocks on child time in school. See Côrtes Neri et al (2005).

\textsuperscript{24} Bherman and Knowles (1999) and Bherman, Birdsall and Székely (1998).

\textsuperscript{25} Bherman and Knowles (1999) and Bherman, Birdsall and Székely (1998) suggest why high-income households with high educated parents may be associated with higher marginal private benefits and lower costs of schooling investments: i) public policies may favor higher-income households by offering them higher-quality or more accessible schooling. ii) households
Behrman, Birdsall and Szekely (1998) define intergenerational mobility as the degree to which the schooling gaps of children who co-reside with their parents cannot be explained by measures of family background, both parents' educational attainment and household income. As schooling is thought to be a major mechanism through which intergenerational social mobility is affected, if schooling has great impact on income and if schooling is strongly affected by family background, intergenerational correlations in incomes across families will be high and intergenerational social mobility as measured by intergenerational relative income changes will be low. If family background plays a minor role in determining schooling, on the other hand, intergenerational social mobility as indicated by relative intergenerational income movements may be high.

To explore the association of schooling gaps with family background the authors regress the schooling gap on three indicators of family background - father's schooling, mother's schooling, household income -, two controls - whether a household is rural or urban and whether it is or not a female-headed household - and a stochastic disturbance term. They use estimating results to construct their intergenerational schooling mobility index, the "proportional intergenerational schooling mobility index", which is one minus the share of the total variance associated with the weighted average of the three family background variables, where the weights are the coefficient estimates.

Dahan and Gaviria (1999) measure social mobility by looking at the extent to which family background determines socioeconomic success. They state that social mobility can be measured by two distinct types of correlations: intergenerational correlations and sibling correlations. Both measures rely on a simple premise: if family background does matter, some connection between the fates of parents and children on the one hand and the fates of siblings on the other should be observed.

The authors propose an index of social mobility for developing countries based on the correlation of schooling outcomes between siblings that measures the extent to which schooling outcomes can be explained by family background. The argument is that, were there perfect social mobility, family background wouldn't matter, siblings wouldn't be more alike than two people taken at random, and the index would be close to zero. Were there little mobility, family background would matter very much, siblings would be very similar and the index would be close to one. Then, the Siblings Correlation Index is based on the assumption that those children who have fallen behind their peers in schooling outcomes by their late teens are the ones who are most likely to experience low socio-economic status during their lives. Mobility is to be greater when the between family variance in child schooling success - defined as not lagging more than a grade below the median for each age level- is small relative to the total variance in schooling success using data on 16-20 year-old siblings who are co-residing with their parents.

Andersen (2001) proposes a new measure of social mobility based on schooling gap regressions and uses the Fields decomposition to determine the importance of family
background in explaining teenagers’ schooling gaps. If family background, namely parents’ education and household income, is important in determining a child's opportunities, then social mobility is low. On the other hand, if family background is not important in explaining opportunities, then social mobility is high. Again, schooling gap, defined in this case as the difference between real and ideal years of education for the age, is used as an indicator of opportunities.

The three measures can be advantageously calculated on standard household survey data, which, unlike longitudinal data, is available in Argentina. In addition, an index of social mobility based on education appears to be more desirable than a measure based on income, because there are many more problems associated with the reporting of income than the reporting of education.

Absolute social mobility may be measured by intergenerational schooling indices, as estimated by Behrman et al (1998) and Andersen (2001), while relative social mobility may be measured by sibling schooling correlation indices, as proposed by Dahan and Gaviria (1999). (Louw, 2005).

Behrman, Birdsall and Székely (1998) and Andersen’s (2001) schooling gap is a very simple indicator of future opportunities. Notwithstanding, it has several advantages compared to measures based on earnings or years of education. First, income measures are notoriously inaccurate, highly dependent on season for large groups of the population, and generally difficult to compare across countries (Andersen, 2001). In addition, as noted in section 2.b, single measures of father’s earnings drive to error measurement as they are improbable good proxies for permanent income. In the case of son’s, measuring earnings near the very beginning of labor life underestimates intergenerational mobility while using earnings from later in the life cycle, overstates it. Additionally, in the case of Argentina, the percentage of sons older than 25 years old co-residing with parents is not enough so as to analyze β elasticity.

Secondly, years of education are not a good measure of educational attainment for young people, because many of them are still in school. School gap is defined as the disparity between the years of education that a teenager or young adult would have completed had she entered school at normal school starting age and advanced one grade each year, on one hand, and the actual years of education, on the other hand. Therefore, it measures years of missing education, which is a relatively simple measure that is easily comparable across countries and population groups, it is rarely misreported, and it can be used for teenagers who are still of school age (Andersen, 2001)29.

According to Andersen (2001) his index is an improvement over the previous ones because his schooling gap regressions are more inclusive and better specified than those in Behrman, Birdsall and Székely, and, unlike their indices, his is not sensitive to the scaling of variables. Secondly, his method includes, on average, 95% of all teenagers, while the Dahan and Gaviria index only includes an average of about 37% of all the adolescents in their selected age group (since they require households with at least two siblings in the chosen age range (16-20) in order to calculate correlations). There is reason to believe that Dahan and Gaviria’s sample is not representative of all adolescents in the age group, since adolescents with many siblings are much more likely to be included. Thirdly, his method directly measures the influence of family background on education gaps while Dahan and Gaviria’s method only measures this indirectly (Andersen, 2001).

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29 Andersen exemplifies: “an 18-year old teenager who has completed 9 years of schooling will register a schooling gap of (18-9-6) = 3 years, if he lives in a country where children are supposed to start school at age 6. If he has actually gone to school all the time between age six and 18 (12 years), but has been retained 3 times and required to repeat a year, then he will still register as having a schooling gap of 3 years, because years of education is calculated on the basis of the level of schooling attained and not the actual years of study”
b. Description of data

To estimate Andersen’s (2001) Social Mobility Index (henceforth SMI), Behrman, Birdsall and Székely’s (1998) Proportional Intergenerational Schooling Mobility Index and Dahan and Gaviria’s (1999) siblings correlation index \( (p_g) \) we use data from Encuesta Permanente de Hogares (EPH)\(^{31}\).

EPH is the Argentinean household survey carried out by Instituto Nacional de Estadística y Censos (INDEC). Punctual EPH started in GBA in 1974 and progressively included new conglomerates to cover 32 urban areas (October 2002) representing approximately 71% of urban areas population and almost 62% of total population. It is a six-month rotating panel -in which 25% of the households rotate every semester- that collects information on individual socio-demographic characteristics, employment status, work hours, wages, income, type of job, education and migration status. It was conducted biannually, in May and October, in cities with over 100,000 inhabitants, until May 2003, when there was a major technical change. Thereafter, continuous EPH is conducted quarterly and semesterly.

To compute SMI, BBS’ index and \( p_g \) index, we use EPH –all conglomerates- from 1996 to 2002. As the key variable of our estimations is schooling gap\(^{32}\), the October wave is chosen to minimize the effects of schooling drop out under the realistic assumption that, given Argentineans’ scholastic term begins in March and ends by late November or early December, the chances to quit schooling are much lower in October than in May.

A few words about the Argentine education system are needed at this point. Until 1993, the system was organized in four basic levels: preschool (at least 1 grade required), Primary (7 grades), Secondary (5 grades) and University. Kindergarten or preschool is designed to provide education for students ranging from ages of 3 to 5 while primary school is aimed at students ranging from 6 to 12 year-old and secondary school at 13-17 year-old students\(^{33}\). In 1993, new legislation was introduced and congress approved a Federal Law of Education. It introduced, among other major changes, the extension of basic education from 8 (last grade of preschool until the last year of primary school) to 10 years, a restructuring of the education system into new levels and the legal formalization of the process of educational decentralization, which had begun in the 1980s. The new structure includes: Basic General Education (EBG) (10 grades), Polyvalent Education (Polimodal) (3 grades) and University. In summary, the initial two grades of secondary education have been included in a basic cycle of education, EGB. In turn, EGB is divided into three stages of three years each.

c. Methodology

School gap as defined in Andersen (2001) is constructed in two stages. First, for each individual, we calculate years of schooling. We consider that if a child declares to be attending at the moment of the interview (October), s/he will complete that year. Therefore, we compute that year as the last year of schooling. For example, a 7 year-old boy attending EGB first grade in October would have two years of schooling: one for kindergarten and one

\(^{30}\) Hereafter BBS.

\(^{31}\) On each survey we perform corrections on the basis of non response at all, error reporting on age and/ or birth time, error reporting or misreporting in educational attainment and non response in variables of our interest. Sample sizes are given in Appendix A, Table 1.a.1.

\(^{32}\) The number of years a child would have completed had s/he entered at age six and advanced one grade each year minus the number of years of schooling s/he actually had completed at the time of the survey.

\(^{33}\) In Technical Secondary Schools there are 6 grades instead of 5.
for the actual first grade. Second, we compute schooling gap as the age at the moment of interview minus years of schooling minus normal school starting age. We perform a correction for month of birth as in Argentina, a child should begin the first year of school if s/he is six years old before June, 30th. In addition, since the last year of kindergarten is mandatory according to law, we consider each child has actually attained that year of schooling, regardless of whether they had or had not completed it. Therefore, we do the following: actual age minus years of schooling minus four if child was born in first semester or if child was born in October, November or December; actual age minus years of schooling minus five if born between July and September.

Furthermore, we calculate same variables for GBA 1981, 1996 and 2002 in order to analyze a longer period. Regrettably, the variable of the survey that asks which last grade was reached is only available since 1996 - though included in questionnaire -, impeding our ability to compute schooling gap for previous years. In the case of GBA 1981, we were able to gain access to a version of rough data of the EPH conducted by INDEC.

Following Andersen (2001), to calculate SMI, we regress schooling gap for 13-19 year-old children on two family background variables, adult household income per capita (inglab_aduhpc) and the maximum of father’s and mother’s education (maxedu). A variety of other variables that might be relevant in explaining schooling gaps are also used as independent variables: age, age of head parent at birth of the child, dummies for the presence of older sisters, older brothers, younger sisters, or younger brothers, a dummy for female-headed households, a dummy for single parent households, a self-employment dummy for the family head, average regional income and average regional education. (Regression 1). A detailed description of variables used is provided in Table 1, Appendix A. Unlike Andersen, we include in our regression children who are not co-residing with their parents, as we consider them to probably be the most affected (negatively) by family background. If we were able to analyze 13-19 year old children not living in a household at all (e.g., jail, street), we would most likely encounter larger effects of family background. In this sense, election of individuals in the sample is biased. EPH only allows us to consider children that are related somehow to household head or work as domestic service, which partially attenuates the bias.

We then use the Fields decomposition (Fields, 1996) on the regression results to calculate the percentage of the total variance in schooling gaps that can be explained by the two family background variables. For each dependent explanatory variable, we calculate a factor inequality weight (F.I.W.), which is the product of the coefficient estimate for each explanatory variable, the standard deviation of that same variable, and the correlation

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34 Years of schooling is calculated upon combination of variables P55, P56, P58 and P58B from EPH. P55 asks whether the interviewed assists or assisted to school; P56 inquires which was the highest level of schooling reached; P58 asks if the level was finished or not; P58b inquires for the last grade passed. Codification of the combination provides years of schooling. A detailed analyze of consistency was conducted in order to eliminate errors.

35 This is to avoid differences in years of schooling of same age children between those who went to kindergarten and those who didn’t. Actually, in terms of building of variables of interest it would have been the same if we had not considered that level for any child. Instead, as it is mandatory, we prefer to include it albeit this. Main concern is about differences in cognitive abilities and skills between those who received early education (3 to 5 years old or even at younger ages) and those who didn’t. Nevertheless, quality aspects of education cannot be assessed with available data in EPH nor is the purpose of this work to analyze such implicances.

36 Compare the following three examples: individual A was born in January 1978, individual in August 1978 and individual C in November 1978. A starts first grade in 1984 at the age of six while B and C start in 1985 (in 1984, they still have 5 years by June 30th). If we calculate schooling gap (SG) by October 1991, A has 9 years of schooling (1 of preschool, 7 of Primary and 1 of Secondary) while B and C have 8 years of schooling (1 of preschool and 7 of Primary). In October 1991, A and B are 13 years old while C is 12 years old. Calculus are: for A: SG=13-9-4=0; for B: SG=13-8-5=0; for C: SG=12-8-4=0.

37 Variable P58b from punctual EPH.

38 We are grateful to our advisor, Phd. Carola Pessino whom performed a cleaning process on rough data of that EPH and kindly provided us with the missing variable. We are also grateful to INDEC personnel who tried to fulfill our information requirement.

39 Details in Table 1.a.2, Appendix A.
between the same variable and the dependent variable. Then, all factor inequality weights in the regression are scaled to sum to $R^2$. Each F.I.W. intends to measure what percentage of the total variation is explained by the respective variable. SMI is calculated as 1 minus the sum of the two factor inequality weights belonging to adult household income per capita and maximum of father’s and mother’s education. We also estimate SMI’s confidence bounds by bootstrapping (100 repetitions) and recomputing F.I.W using minimum and maximum values of estimated coefficients.

SMI value indicates how much variation in schooling gaps is not explained by family background. So, higher values indicate more social mobility. If SMI index is low, family background is an important determinant of the education gap, and consequently, social mobility is low.

Interestingly, schooling gap regression results also contain important information about the differences in opportunities between young people from different types of households (interhouseholds approach) and even between young people within the same household. (intrahouseholds approach). Those effects will be analyzed in next section.

To calculate “Proportional Intergenerational Schooling Mobility Index”, alternatively known as Family Background Mobility Index, we proceed as in Behrman, Birdsall and Székely (1998). First, we divide our sample (EPH October wave) by four age groups (10-12, 13-15, 16-18, 19-21) and later by parental schooling quintile. This is because, as BBS, we are interested in comparing the situation of the poorest households in the bottom quintile with that of households in the top position and to lessen the risk of biases due to school continuation selectivity on unobserved ability. In addition, we expect nonlinearities in the associations between the indicators of family background and schooling gaps for each age group as we presuppose that there are differences across age groups and educational attainment of parents.

Parental schooling in monoparental households equal years of schooling of existing parent while in the case of biparental households, we calculated it as the average years of schooling between both parents. To obtain quintiles of parental schooling in each subsample (restricted by age) we follow standard procedures.

Then, we regress schooling gap (brecha3) on three indicators of family background: father’s schooling (educacion_p), mother’s schooling (educacion_m), household income per capita (hpci), a dummy variable that indicates whether it is a female-headed household, and a stochastic disturbance term (e). (Regression 2)

We estimate regression (2) for each of the 20 survey-quintile-age group subsamples for EPH (all conglomerates) 1996, 1998 and 2002. We also provide estimations of relation (2) for GBA 1981, 1996 and 2002.

Third, we use the results of estimating equation (2) to construct for each of the 120 subsamples (all conglomerates, 3*4*5, and GBA only 3*4*5) BBS’s intergenerational schooling mobility indices, the “proportional intergenerational schooling mobility index” defined as one minus the share of the total variance associated with the weighted average of the three family background variables, where the weights are the coefficient estimates. As in Louw et al (2005), we use the coefficients on parents' education and household income as

---

40 Cameron and Heckman (1998), for example, note that most of the literature on the effects of parental background on children’s attainment concludes that the effect of family background declines after secondary schooling, but claim that these estimates suffer from omitted ability bias because more able children normally progress more in the education system, which affects the estimates of family background effects. By subdividing the sample by age groups and by controlling for age groups in the estimates there is attempt to avoid this problem. (Bherman, Birdsall and Székely, 1998).

41 First we multiply variable parental schooling by a random number between 0 and 0.0001 to avoid unbalanced number of individuals in each quintile. Second, we sort subsamples by this parental schooling and divide in five groups.

42 As in BBS, when a child (under 18 years old) earns an income, we subtract such income from the total household per capita income.
weights to estimate the predicted schooling gap of each child. The variance of this variable is divided by the variance of the actual schooling gap variable to obtain a ratio that is independent of the absolute magnitude of the schooling gap. As we get an immobility index, a value that is close to zero indicates a high level of mobility, while a value close to unity indicates low levels of mobility.

To compute the Siblings Correlation Index ($p_g$), following Dahan and Gaviria (1999), we first restrict October wave of EPH to children between 16 and 20 years old and to those households with two or more children in the specified age range. Second, we calculate the median schooling for each cohort defined on the basis of age and gender. Third, we build a binary indicator of socioeconomic failure that identifies the “losers”, those who have fallen so far behind that socioeconomic success is improbable. A value of one is assigned to those children whose schooling is greater than the median minus one (those whose fate is still uncertain) while a value of zero is given to the losers. Fourth, we compute the index of correlation:

$$
\rho_g = \frac{\sum_{f} \sum_{s \in f} (s_f - \bar{g})^2 \sum_{s \in f} (s_f - \bar{g})^2 / S_f}{\sum_{f} \sum_{s \in f} (s_f - \bar{g})^2}
$$

where $F$ is the number of families in the sample, $S_f$ is the number of teenage siblings in family $f$, $g_f$ is the binary indicator of socioeconomic failure of individual $s$ in family $f$, and $\bar{g}$ is the average indicator in the entire sample. As $p_g$ could yield positive values even if family background is inconsequential, as will be the case, for example, when children are assigned to families randomly, Dahan and Gaviria (1999) follow Kremer and Maskin (1996) and define an alternative index as follows:

$$
\rho_a = 1 - (1 - \rho_g) \frac{S - 1}{S - F}
$$

where $S$ is the number of children in the sample. The new index ($p_a$), which corresponds now to the adjusted R$^2$ obtained by regressing earnings on family dummies, will yield positive values only if the previous index ($p_g$) is greater than would be expected purely by chance. Positive values of $p_a$ can thus be unambiguously interpreted as evidence that family background does play a role in the determination of schooling outcomes.

Higher values of the index entail lower degrees of intergenerational mobility. Namely, higher values allow a higher fraction of the differences in socioeconomic performance among children to be explained by family background.

d. Estimation results

Results for regression (1), both for total conglomerates and GBA, are given in Table 1b Appendix A. SMI for each year is presented in Table 1c and Table 1d.

SMI values for Argentina between 1996 and 2002 are close to one, being estimated $\text{SMI}_{06}=0.8824$ and $\text{SMI}_{02}=0.8937$. Little of schooling gaps is explained by family background. Therefore, intergenerational social mobility in Argentina seems to be high. As Figure 1 in Appendix B shows, there are no perceivable improvements in educational mobility between 1996 and 2002. Total SMI with 95% confidence bounds presented there appears to be stable over the period and supports the conclusion that there have been no changes.

43 Dahan and Gaviria state that, as shown by Kremer and Maskin (1996), $p_g$ corresponds to the R$^2$ obtained by regressing the schooling gaps on a set of dummy variables for all families in the sample.
Our result (0.8824) is similar to that of Andersen for Argentina 1996\(^{44}\). He reports 13-19 years old SMI of 0.8923 and 0.9035 for boys and girls respectively and found Argentina to be among most mobile countries in Latin America, as Figure 2 in Appendix show. That figure, extracted from Perry et al (2004), compares measures of intergenerational social mobility in Latin America obtained by Behrman, Birdsall and Székely (1998), Andersen (2001) and Dahan and Gaviria (1999). In the two first rankings, Argentina stands out as a highly mobile country while in Dahan and Gaviria’s rankings it is placed in an intermediate position.

Analog analysis is performed in a longer period, from 1981 to 2002, in Gran Buenos Aires, with confidence intervals obtained by 100 repetitions bootstrap presented in Table 1.d. SMI values for 1981, 1996 and 2002 are 0.94, 0.86 and 0.87 show a slight decline. However, levels of SMI remain high indicating a mobile society. Andersen (2001) places Peru in the high social mobility group of countries, reporting a SMI value of 0.86.

Interfamily analyses reveal that teenagers living in female-headed households are not better or worse off than teenagers living in male-headed households. The dummy variable that indicates the presence of female-headed household is not significant at any level in any period in all agglomerates, except 2002. In turn, dummy variable for monoparental household appears to be significative in some periods while not in others. Given the fact that most single-parent households are headed by women in Argentina, it is possible that both dummies are highly correlated and therefore, the coefficients are less efficient\(^{45}\). Self-employment status of head of household does not appear to affect schooling gap nor regional average income and regional average education level.

Intra-household analyses for total Argentina show that there is a life cycle effect and that the younger the head of household when s/he becomes a parent, the larger is schooling gap for the child. If a child is born early in the life cycle of the parents there will usually be fewer resources available for the education of the child. As was expected, the variable indicating age of head of household at birth of first child is statistically significative and negative. Having younger siblings or older brothers increases schooling gaps while having older sisters decreases it. This confirms the idea that the number and order of siblings is highly important.

Our results for Family Background Immobility Index are similar to those reported by BBS and are presented in Table 2a in Appendix B. Table 2b shows the corresponding Mobility Index. The only difference between them is that in table a we present the predicted schooling gap-actual schooling gap ratio\(^{46}\) while in table b we subtract that value from one. Since we calculate immobility indexes in the case of all quintile subsamples, we report both but refer our analysis to Immobility index.

Family Background Immobility Index for Argentina in 1996, 1998 and 2002 are close to zero and do not show any major change (Figure 2). Average results show a slight decrease in social mobility in 1998 (0.1689)\(^{47}\) while values of 1996 (0.1458) and 2002 (0.1319) remain similar. Slight differences may be due to sample size and short period of analyses\(^{48}\). Using Family Background Immobility Index, intergenerational social mobility has not changed in Argentina between 1996 and 2002. Results for GBA, in Table 2a, show slightly less level of mobility in 1996 but almost to the same extent as in 1981 and 2002.

\(^{44}\) Our results are also similar to that of CEDLAS, which, to the extent of our knowledge, is the only institution calculating SMI in Argentina. Unfortunately, they do not provide data on confidence intervals. For details, see http://www.depeco.econo.unlp.edu.ar/cedlas/default.html.

\(^{45}\) We estimated a modified version of original Andersen regressions, including only a dummy for monoparental households with female household. It turned out to be not statistical significative. Results for this are not shown in this version.

\(^{46}\) Predicted schooling gap is obtained using family background estimated coefficients from relation 2.

\(^{47}\) Higher values of Immobility index indicate less intergenerational mobility.

\(^{48}\) BBS do not report sample sizes or corrections performed to database. We also estimate Family Background Immobility Index in a sample of 10-21 years old individuals. Results (Coef. Estimated, in Table 2a) show a slight increase in social mobility in 2002.
As we expected, the coefficients of income are negative, then more income reduces the schooling gap. The coefficient is more negative the older the child. For the 19-21 age group (e.g. -386.75 in 1998) around 3 times larger than 10-12 group (e.g. -126.54 in 1998). The same pattern holds for mother's and father's education. The coefficient of the mother's (father's) education is on average more than four (eight) times larger for the 19-21 group compared to the 10-12 group.

When analyzing results by quintile, it is a general finding that lower quintiles have less social mobility in all age groups and that greater mobility is associated to younger children. The first two age groups seem to be more mobile than the last two. GBA analysis on the basis of quintile is not recommended as subsamples by age and parental schooling restrict sample size to very few observations, especially those in the top quintile. Tests of global significance are usually not significative, therefore, results are not presented.

On a quintile basis, coefficients of income are also negative, the more the poorer the quintile and the older the child. Nevertheless, coefficients of income are usually not significative for the top quintile and F-test tends to be significative at lower levels when considering quintile 5. Results must be interpreted carefully at this point.

Siblings Correlation Index is presented in Table 2a and Figure 2. The percentage of socioeconomic performance –as measured by pa– explained by family background appears to be slightly decreasing over time. This would entail that in Argentina, between 1996 and 2002, intergenerational social mobility has been increasing quite slowly.

Our pa for total Argentina (0.4845) is similar to that of Dahan and Gaviria (1999) for 1996 (0.437). This value places Argentina between the most mobile countries, United States (0.23) and Costa Rica (0.34), and the least mobile Colombia (0.58), Mexico (0.59) and El Salvador (0.59) included in Dahan-Gavirias’.

We test robustness of this index to small changes in the methodology. As in Dahan-Gaviria (2000) we use the median minus two years of schooling (robustness test I) and median schooling, computed as average education attainment in years of children of same age and gender that are doing fine in school –e.g., they are not behind the supposed level for the age. Figure 3b shows the evolution of alternative pa’s. Correlation between first and second estimation (Test I) is -0.82 while correlation between first and third estimation (Test II) is -0.43. Correlation among Test I and II is 0.36. Unfortunately, these results cast doubts about the strength of the index to small changes in arbitrary definitions.

Noteworthy, Dahan and Gaviria’s measure is biased in the sense that it avoids families with one child, which are precisely those that have higher educational attainment and income of parents. Omitting them could lead to overstatement of intergenerational mobility.

5. Implications

Estimation of intergenerational social mobility in Argentina is a major contribution of this paper. All three measures presented above show a mobile society. SMI and Family Background Immobility index indicate no major changes between 1996 and 2002 on a national basis while Siblings Correlation suggests a slight progressive increasing in intergenerational social mobility. However, robustness of last index is doubtful. In Greater Buenos Aires, according to SMI results, there seems to be a slight decline between 1981 and 1996.

Estimation of pa was also performed for GBA in 1981 and between 1996 and 2002. Nevertheless, results are not presented here as they show erratic patterns. This obeys to the small and not representative sample left after restricting EPH as explained above.

Our 1996 sample includes 1997 families while due to corrections performed while Dahan-Gavirias’ 2098.
2002. Family Background Index shows a slight decrease in social mobility in 1996 but almost the same values as in 1981 and 2002.

This could be interpreted as a positive structural characteristic of our society. Furthermore, given that inequality has been rising while intergenerational social mobility stayed high and without dramatic changes, most optimistic policy makers could understand this as a sign that levels of inequality would reverse on their own and converge alone to its more permanent mean. Some words of precaution are needed at this point.

In first place, all three measures have advantages as well as disadvantages. However, in the absence of longitudinal data or long enough pseudo panel data, despite measurement error and the quite arguable assumptions they are based on, their usefulness deserves to recognition.

We agree with Dahan and Gaviria (1999) that at first glance, there is very little to be learnt about intergenerational relations from household surveys. Not only do we observe parents and children at very different ages, but also we observe children so early in their lives that little can be inferred about their socioeconomic performance later in life.

In second place, neither the indexes nor the available data can account for school quality, community characteristics, innate abilities and unobserved characteristics of parents. We do not know how much of schooling gaps can be explained by differences in cognitive ability, early family environment and stimulation as well as appropriate nourishment. Nor do we know if schooling gaps would be larger provided nutrition food programs were not held in public schools. Most likely, children of poor households would not attend and be used as household labor force if there were no "copa de leche\(^{51}\) or if subsidies didn’t impose school attendance on beneficiaries’ offspring as a form of social payback.

Carneiro, Cunha and Heckman (2003) suggest that differences in levels of cognitive and noncognitive skills by family income and family background emerge early and persist. If anything, schooling widens these early differences. If this is true, then schooling gap would reflect what we can’t gauge with conventional household surveys and the credibility of the measures calculated in this paper would be higher.

Third, even when sibling correlations summarize all influences common to all children in a given family and most probably community characteristics such as school quality, common friends and contacts and neighborhood norms, also leaves out all family influences not shared by siblings. In this sense, Andersen’s SMI accounts for differences in birth order, kind and quantity of siblings and the moment of life cycle when birth occurs.

Fourth, neither of the measures includes any effect of public policy. Again, available data does not allow us to distinguish between public or private education. Would there be high educational mobility if there were no public school? Would public school pupils have more or less equality of opportunity than those attending to private schools? These questions cannot be analyzed within data framework of EPH\(^{52}\).

Fifth, a main concern is that family background variables used in the calculus of indices can lead to an underestimate of the total effects of family background, as, for example, parent education and income are correlated less than perfectly. Additionally, it is highly probable that they correlate with some other aspects of family background that may be relevant, such as long-run income or wealth, influence and connections.

\(^{51}\) “Copa de leche” is a kind of nutrition program held at public schools. Also, great majority of them serve lunch to their students and even parents. In some cases, this is the only meal a poor child gets and school is a mean of providing something to eat more than a place to receive education.

\(^{52}\) This could be track using Encuesta de Desarrollo Social (EDS) of 1997 or Modulo Especial de Educació EPH 1998. Unfortunately, they are not systematic and regular surveys, therefore, there’s not much possibility to extend analyses in time.
Last, the use of a single-year measure as a proxy for longer-run earnings leads to measurement errors as explained in section 2.b. EPH does not allow for a more permanent income measure than the one that can be obtained by building a short pseudo panel. Notwithstanding that correction, there still remains the possibility that parents are surveyed too early or too late in their life cycle and so, the pseudo long-run income measure would also lead to underestimation or overstatement of mobility.

6. Conclusion y future agenda

Considering social mobility is important for a number of valuable reasons. Greater social mobility is likely to imply greater efficiency and productivity through more efficient transactions. People perceive that society is fairer if there is greater relative social mobility. Furthermore, it may be related to increasing social and political cohesion, decrease violence and crime and provide greater political support for the system from those in the lower part of the distribution.

Above all, as mobility provides a better measure of changing opportunities than do traditional measures of inequality, and given that understanding mobility is critical to the discussion of inequality and of what to do about it, this work analyzes the existence and extent of intergenerational social mobility in Argentina by means of three different measures. They all show a highly mobile society but indicate no dramatic changes between 1981 and 2002.

Given the absence of longitudinal data or long enough pseudo panel data, despite measurement error and the quite arguable assumptions these measures are based on, their helpfulness deserves recognition. All together, they provide a first approach to a concern that requires as much development of new regular data survey as empirical techniques.

New contributions in line with this work would include extending period analysis within new EPH, reestimation of SMI using a more permanent measure of income, eg. building pseudo data panel53, exploring cohort analysis and applying matching or simulation techniques to more comprehensive but not regular surveys like Encuesta de Desarrollo Social (EDS) or Módulo Especial de Educación EPH 1998. Unfortunately, they are not systematic and regular surveys, therefore, possibilities to extend analyses in time should be evaluated.

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8. Appendix A

Table 1a: Description of variables used in SMI estimation

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brecha3</td>
<td>Schooling gap Calculated as actual age minus years of schooling minus four if child was born in first semester or if child was born in October, November or December; actual age minus years of schooling minus five if born between July and September</td>
</tr>
<tr>
<td>Esco</td>
<td>Years of schooling Calculated upon combination of variables P55, P56, P58 and P58B from EPH. P55 asks whether the interviewed assists or assisted to school; P56 inquires which was the highest level of schooling reached; P58 asks if the level was finished or not; P58B inquires for the last grade passed. Children of four years or less are assigned esco equal to zero. Individuals who are not responding one or any of questions P55, P56, P58, P58B are not considered in regression estimation.</td>
</tr>
<tr>
<td>Inglab_aduhp</td>
<td>Adult household income per capita Calculated as the sum of labor income of household members older than 18 years old divided 1000 (for better interpretation of estimation results) and divided by the number of members of household. The resulting amount is imputed to each household member.</td>
</tr>
<tr>
<td>maxedu</td>
<td>Maximum of father’s and mother’s education Calculated as the maximum years of schooling between father and mother.</td>
</tr>
<tr>
<td>Edjefe</td>
<td>Age of head of household at birth of first child</td>
</tr>
<tr>
<td>Jefa</td>
<td>Dummy for female headed household</td>
</tr>
<tr>
<td>Monoparental</td>
<td>Dummy for single parent household</td>
</tr>
<tr>
<td>Hnamenor</td>
<td>Dummy for the presence of younger sister</td>
</tr>
<tr>
<td>Hnomayor</td>
<td>Dummy for the presence of older sister</td>
</tr>
<tr>
<td>Hnomayor</td>
<td>Dummy for the presence of older brother</td>
</tr>
<tr>
<td>Adomujer</td>
<td>Dummy for the presence of a female teenager</td>
</tr>
<tr>
<td>Aroda</td>
<td>Age of teenager</td>
</tr>
<tr>
<td>Cpropia</td>
<td>Dummy if head of household is self-employed</td>
</tr>
<tr>
<td>An</td>
<td>Average regional income Calculated as average household income per capita for each statistical region</td>
</tr>
<tr>
<td>Arel</td>
<td>Average regional education level</td>
</tr>
</tbody>
</table>
### Table 1a.1: Sample Size EPH

<table>
<thead>
<tr>
<th>Year</th>
<th>Total N</th>
<th>N after correction 1</th>
<th>Percentage of 13-19 not co-residing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>107692</td>
<td>109302</td>
<td>13.7%</td>
</tr>
<tr>
<td>1997</td>
<td>109199</td>
<td>99174</td>
<td>12.9%</td>
</tr>
<tr>
<td>1998</td>
<td>109199</td>
<td>99108</td>
<td>12.2%</td>
</tr>
<tr>
<td>1999</td>
<td>109199</td>
<td>99108</td>
<td>12.7%</td>
</tr>
<tr>
<td>2000</td>
<td>109199</td>
<td>99108</td>
<td>12.9%</td>
</tr>
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</tr>
<tr>
<td>2004</td>
<td>109199</td>
<td>99108</td>
<td>12.7%</td>
</tr>
</tbody>
</table>

Notes: Correction 1: drops for age errors and no response at all to survey

### Table 1a.2: Estimation of SMI

#### Sample A (after correction 2)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total N</th>
<th>N after correction 1</th>
<th>Percentage of 13-19 not co-residing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>15389</td>
<td>9852</td>
<td>13.6%</td>
</tr>
<tr>
<td>1997</td>
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<td>9852</td>
<td>13.6%</td>
</tr>
<tr>
<td>1998</td>
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<td>9852</td>
<td>13.6%</td>
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<tr>
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<td>15389</td>
<td>9852</td>
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</tr>
<tr>
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#### Table 1b: Estimation Results

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<td>2002</td>
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</tbody>
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#### Source:
Authors' calculation on EPH, october of each year

### Fields Decomposition

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### SM1

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<tr>
<th>Year</th>
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<tbody>
<tr>
<td>1996</td>
<td>0.8824</td>
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</tr>
<tr>
<td>1997</td>
<td>0.8637</td>
<td>0.8699</td>
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<tr>
<td>1998</td>
<td>0.8849</td>
<td>0.8911</td>
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<td>1999</td>
<td>0.8938</td>
<td>0.9414</td>
</tr>
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<td>2000</td>
<td>0.8664</td>
<td>0.8734</td>
</tr>
</tbody>
</table>

### Source:
Authors' calculation on EPH, october of each year

---

**Page - 29**
Table 1c: SMI for 13-19 years old teenagers

<table>
<thead>
<tr>
<th>Year</th>
<th>SMI</th>
<th>95% confidence interval</th>
<th>Var % SMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>0.882486</td>
<td>0.875278 - 0.889730</td>
<td>0.700</td>
</tr>
<tr>
<td>1997</td>
<td>0.874486</td>
<td>0.863361 - 0.885379</td>
<td>-0.91%</td>
</tr>
<tr>
<td>1998</td>
<td>0.893660</td>
<td>0.853110 - 0.874365</td>
<td>-1.24%</td>
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<tr>
<td>1999</td>
<td>0.889869</td>
<td>0.879380 - 0.900286</td>
<td>0.33%</td>
</tr>
<tr>
<td>2000</td>
<td>0.884912</td>
<td>0.871690 - 0.897659</td>
<td>-0.56%</td>
</tr>
<tr>
<td>2001</td>
<td>0.891049</td>
<td>0.879349 - 0.902876</td>
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</tr>
<tr>
<td>2002</td>
<td>0.893791</td>
<td>0.883245 - 0.904488</td>
<td>0.31%</td>
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</table>

Source: Authors’ calculation on EPH, october of each year

Table 1d: SMI for 13-19 years old teenagers

<table>
<thead>
<tr>
<th>Year</th>
<th>SMI</th>
<th>95% confidence interval</th>
<th>Var % SMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>0.86640</td>
<td>0.83540469 - 0.89964879</td>
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<tr>
<td>1997</td>
<td>0.87340</td>
<td>0.83389240 - 0.91537876</td>
<td>0.61%</td>
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</table>

Source: Authors’ calculation on EPH, october of each year

Table 2a: Family Background Immobility Index

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Quintile 1</td>
<td>0.0731</td>
<td>0.1257</td>
<td>0.0967</td>
<td>0.0568</td>
<td>0.0585</td>
<td>0.0452</td>
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<tr>
<td>Quintile 2</td>
<td>0.0971</td>
<td>0.1342</td>
<td>0.1299</td>
<td>0.1209</td>
<td>0.0647</td>
<td>0.1279</td>
</tr>
<tr>
<td>Quintile 3</td>
<td>0.1602</td>
<td>0.1791</td>
<td>0.1193</td>
<td>0.1427</td>
<td>0.2275</td>
<td>0.2011</td>
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<tr>
<td>Quintile 4</td>
<td>0.2228</td>
<td>0.2003</td>
<td>0.2116</td>
<td>0.1988</td>
<td>0.3652</td>
<td>0.1723</td>
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<tr>
<td>Quintile 5</td>
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<td>0.2603</td>
<td>0.2685</td>
<td>0.2831</td>
<td>0.3142</td>
<td>0.2626</td>
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</tbody>
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Source: Authors’ calculation on EPH, october of each year

Table 2c: Family Background Immobility Index by parental schooling quintile

<table>
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<tbody>
<tr>
<td>Quintile 1</td>
<td>0.0460</td>
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<td>0.0646</td>
<td>0.0466</td>
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</table>

Source: Authors’ calculation on EPH, october of each year

Figure 1

Social Mobility Index in Argentina

Figure 2

Social mobility index for teenagers (point estimate and 95% confidence interval)

*Based on urban samples only.

Source: Authors’ calculation on EPH, october of each year

Figure 2a

Social mobility index in Latin America and in the United States

Source: Behrman, Ginnia, and Saldias (2001)

Figure 2b

Social mobility in the Americas

Source: Behrman, Ginnia, and Saldias (2001)

Figure 2c

Social mobility index by parental schooling quintile

Source: Behrman, Ginnia, and Saldias (2001)
Table 3a: Dahan-Gaviria’s Mobility Index

<table>
<thead>
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<tr>
<td></td>
<td>pg</td>
<td>Var % Index</td>
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<tr>
<td>1981</td>
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<td>1996</td>
<td>0.770688</td>
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<td>1997</td>
<td>0.758416</td>
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<td>0.747722</td>
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</tr>
<tr>
<td>2000</td>
<td>0.744074</td>
<td>-0.488%</td>
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</tbody>
</table>

Source: Authors’ calculation on EPH, October of each year.

Table 3b: INDEX OF EPH, October of each year

<table>
<thead>
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<th>Year</th>
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<td>Robustness Test II</td>
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</table>

Figure 3a: Siblings Correlation Index Argentina

Figure 3b: Siblings Correlation Index Argentina - Robustness Test