

# The Inheritance of Poverty in El Salvador: *Why is it hard to overcome destiny?*

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This article attempts to answer how poverty is transmitted between generations in El Salvador. It combines poverty measurement methodologies with social mobility tools to create a new framework for analysis of poverty dynamics. The paper offers an innovative deprivation approach of social mobility which describes the inheritance poverty process between two generations. The methodology is divided in two steps: the first one uses the Alkire-Foster methodology of multidimensional poverty to identify the poor and aggregate the results in an index. The second one develops a Poverty Inheritance Framework (PIF) to understand the disadvantages that children with poor parents have to cope with to find a way out of poverty. PIF methodology combines social mobility tools and adapts them to poverty inheritance. The methodology uses transition matrixes, relative rates of mobility, intergenerational transition probabilities and rank-rank estimates. The results find evidence that poverty inheritance exists in El Salvador and it is significantly strong. Also it is demonstrated that average social mobility measures may hide important information about poverty traps. Finally, the evidence shows that girls with a poor mother may face the strongest disadvantage in order to find a way out of poverty in El Salvador.

*Keywords:* poverty inheritance, poverty measurement, social mobility, poverty transmission, El Salvador

## 1. Introduction

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Using the case study of El Salvador, this paper will analyze the process of inheritance of poverty. The paper will have a deprivation perspective, mainly focus on people who are deprived (Anand & Sen, 1997). The traditional social mobility literature has offered a conglomerative or general perspective taking into account each member of society. That approach is valid and necessary. However, development literature needs also a deprivation perspective. This paper will contribute to this discussion.

This research project is based in the results of the Social Mobility Survey (SMS) of the Human Development Report of 2013 prepared with data of El Salvador by the United Nations Development Program (UNDP). Although, the methodology is based on this data source, it can be replicated using other surveys.

The paper uses the Alkire-Foster methodology of multidimensional poverty to identify the poor and aggregate the results into an index. After this process, it develops a new framework to analyze and describe poverty inheritance based on previous literature of social mobility and adapted to the deprivation perspective that the paper follows. The Poverty Inheritance Framework answers seven specific questions using four social mobility tools. The tools are transition matrixes, relative rates of mobility, intergenerational transition probability and rank-rank regressions. Combining the four tools a better picture of poverty inheritance is revealed.

The paper has the following structure: Section 2 is a theoretical framework which aims to understand the linkage between poverty and social mobility. Section 3 discusses the data details and variable definitions. The methodology is explained in detail in Section 4, while Section 5 describes the results in El Salvador using SMS survey. Finally, Section 6 makes closing remarks about the methodology and how it can help public policies in El Salvador.

## **2. Theoretical framework**

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Tackling poverty has been one of the most important development issues in history. However, poverty still remains as a reality for many households in the world. Many public policies have tried to target the poor, using static welfare indicators (Baulch & Hoddinott, 2000). The result is those public policies include errors of both inclusion and exclusion leaving behind vulnerable groups. This failure motivates this paper to understand deeply the dynamics of poverty. In this line, using the case study of El Salvador, this paper attempts to answer how poverty is transmitted between generations, and shows that a dynamic perspective of poverty can help policymakers to tackle chronic poverty using a new analysis framework. This theoretical framework explains how poverty inheritance can be understood as a combination of poverty and social mobility's definitions.

### **A broad definition for poverty**

Poverty analysis has been a key feature in development literature. Although, there is no consensus about a definition of poverty, following the Capability Approach, poverty is more than a lack of money (Alkire, 2005). Moreover, according to Anand and Sen (1997), "poverty is, in many ways, the worst form of human deprivation; it can involve not only the lack of necessities of material well-being, but also the denial of opportunities of living a tolerable life" (Anand & Sen, 1997).

Therefore, a broader measure of poverty is required. This broader measure of poverty should also take into account how poor people live poverty. In the specific case of El Salvador, UNDP (2014) explored what poverty means for poor people. The main idea is that poverty is not having a certainty of the future (UNDP, 2014). In addition, poverty is synonym of being unable to meet the basic needs of the family because poor people may not have jobs and the labor opportunities are unstable because lack of education. (UNDP, 2014).

In this line, the research project is based on a broad definition of poverty that entails deprivations in some dimensions linked to human development. In addition, a poverty definition should be linked with the poverty measure that is used. Sen (1976) stated that an efficient poverty measure should take into account two processes: identification of the poor and aggregation into a poverty measure (Sen, 1976). Traditionally, countries have identified

the poor comparing household income with a poverty line. However, new methodologies have been developed in our days. For example, the Alkire-Foster multidimensional poverty method offers a general framework where users can choose poverty dimensions, dimensional cutoff, weights and poverty cutoff (Alkire & Foster, 2011b). This methodology also offers a dual cutoff identification process and an aggregation method that may use FGT measures (Alkire & Foster, 2011b).

Nevertheless, a static measure of poverty is not enough to understand and resolve this problem because parents' characteristics affect children development (Musick & Mare, 2006). The intergenerational transmission of poverty may help to explain why some people remain poor or why others are able to find their own way out of poverty. The knowledge of factors associated with movements into and out of poverty have great value in public policies because it may prevent poverty traps (Baulch & Hoddinott, 2000).

### **Social mobility as a tool of poverty inheritance**

The intergenerational perspective of poverty inserts social mobility methodologies to the traditional poverty measurement methods. According to Chetty et al. (2014) "studies of intergenerational mobility seek to measure the degree to which a child's social and economic opportunities depend of his parents' income or social status" (Chetty, Hendren, Kline, Saez, & Turner, 2014). In the same way, poverty inheritance will measure the degree of association between parents and children's conditions. A higher association will mean that the ideal of equal opportunity may not be held. In other words, a young adult's social and economic destiny is predetermined in some ways by their origins (Corcoran, 1995).

The equal opportunity failure may be explained by the process of creating capabilities. According to Nussbaum (2011), capabilities are a "set of (usually interrelated) opportunities to choose and act" (Nussbaum, 2011). The capabilities are freedoms created by a combination of personal abilities and the political, social and economic environment (Nussbaum, 2011). Each child develops its own capabilities when his abilities are combined with the specific environment that he may have access. Children of poor households may not have access to economic resources such as electricity or their parents may not be able to help them in their learning process. Therefore, inequalities are formed and transmitted since birth.

The literature of social mobility has mainly been focused on a general analysis of movements in the whole population. Nevertheless, the dynamics inside different population groups may be different. According to Johnson and Reed (1996) "people at the extreme ends of the distribution are particularly subject to immobility" (Johnson & Reed, 1996). For that matter, social mobility analysis should be divided in two approaches, one general and one specific.

In agreement to Anand and Sen (1997), social mobility, as a development topic, can be understood in two complementary ways: a conglomerative perspective where the lives and successes of everyone should count and a deprivation perspective interested in those who are forced to live deprived lives (Anand & Sen, 1997). Both approaches are relevant when development issues are analyzed. But, this paper will leave behind the typical conglomerative perspective of social mobility. It will offer a deprivation perspective only focused on people who are identified as poor.

**The inheritance of poverty**

Combining multidimensional poverty measurement and social mobility methods, the analysis of poverty inheritance can be pursued. As was discussed above, inequalities are transmitted by parents to children. The heritage can be transformed into a vicious cycle of poverty where poverty is perpetuated among generations (Corcoran, 1995).

The literature has remarked some factors that may cause poverty inheritance. The poverty inheritance is caused for a lack of resources to develop children's capabilities (Cooper, 2010). The most important factors that previous research projects have pointed out are parents' education, neighborhoods conditions, and family structures.

First, parents' education may affect the development of their children's human capital (Corcoran, 1995). The recognition and appreciation of education also influence the decision of what type of school will the children attend and how many hours will they have available to study. Education may act as a source of inequality if rich and poor children go to different schools of different quality (Ng, 2013).

Second, the neighborhood affects the capabilities formation process of children. According to Ravallion (1996) "poor local infrastructure, may entail lower current incomes, but also less chance of escaping poverty because of adverse effects on the productivity of private investment" (Ravallion, 1996). Using evidence from United States, Chetty et al. (2014) concludes that intergenerational mobility varies across areas and one of the main causes is residential segregation (Chetty et al., 2014). In addition, disadvantaged neighborhoods may affect poverty inheritance by providing lower quality schools, fewer role models and fewer job networks (Corcoran, 1995). Those characteristics may entail a spatial poverty trap where only migration may be a solution (Cooper, 2010).

Finally, poverty inheritance seems to be highly correlated with family structures. Using data from United States, Chetty et al. (2014) found that children raised by a single parent may have worse outcomes than those raised by two parents (Chetty et al., 2014). Musick and Mare (2006) add that "the double disadvantage of poverty and single parenthood may leave families with fewer resources to deal with any form of adversity, pushing them over a threshold that strengthens the persistence of poverty" (Musick & Mare, 2006).

In conclusion, the linkage between poverty measurement and social mobility is critical to develop better public policies to tackle poverty in the next years. Poverty inheritance may be the bottleneck where several poverty programs' results are stuck. The next sections will discuss how poverty inheritance can be measure and what lessons can be extracted to inform Salvadoran public policies.

### 3. Data and variable definitions

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#### Database details

Data requirements to measure intergenerational mobility are rigorous. The ideal scenario should be having a panel survey with information about parents and children for several years. However, for developing countries this kind of surveys is too expensive and it is not a policy priority. In order to fulfill this gap, UNDP carried out a social mobility survey (SMS) for El Salvador in 2013. The survey is based on 1632 Salvadoran households and its sampling design allows representativeness at country level. This is a one-round survey with interviews to men or women 25 years or older who disclose information for his or her family. The SMS survey captures information for 3 generations of Salvadorans (UNDP El Salvador, 2013). The survey, an innovative step in social mobility in El Salvador, offers a set of data about education, job's conditions, household's conditions and several shocks that children may suffer before reaching the age of 18, such as adolescent pregnancies and death of family members.

However, it has some potential problems that are important to point out. First, income and earnings are not reported exactly, but are arranged into 7 groups. Also, both income and earnings variables have approximately 20% of missing values. Finally, recalling parents' income is a difficult process then this variable is omitted for the first generation. The shortcomings that income presents in this survey motivate this research about multidimensional poverty transmission instead of economic transmission.

#### Variable Definitions

In this subsection, the variables used to measure poverty inheritance are defined. Those definitions will be helpful to understand the methodology developed in the next section.

- Generations covered in the SMS survey  
The survey offers information for 3 generations: parents, children and grandchildren. However, the paper will be mainly focused on the first and second generations because they have more available data. In addition, third generation is very diverse in age; the majority of the grandchildren are younger than 18 years old, meanwhile the parents and children are older than 25 years old. If grandchildren data is used, some poverty indicators will have missing values because grandchildren have not reached the criteria to show if they are deprived or not. This situation is more relevant in the education dimension.
- Multidimensional poverty measure  
One of the key ideas behind this paper is that poverty is more than a lack of money. Then multidimensional poverty will be understood as a person's condition when he or she is deprived on several human development dimensions. In this research project three dimensions will be defined: education, household's conditions and access to services. Those dimensions are in line with the results of UNDP (2014) project about poverty in El Salvador which was based on a qualitative research where more than 40 focus groups were conducted to understand what poor people think about poverty and its deprivations (UNDP, 2014). The multidimensional poverty measure used in this paper will not take into account all the 8 dimensions

discovered by the UNDP project, however it will adapt the methodology using the available data. In the next section, the methodology will be defined in detail.

- Poverty score  
The poverty score measures the weighted deprivations that each person may have after conducting Alkire-Foster methodology.
- Deprivation distribution  
This is a rank distribution created in the SMS survey based on the poverty score of each person. The first positions of the rank correspond to the most deprived people and the highest positions correspond to the least deprived people.
- Location index  
Following the poverty inheritance literature, neighborhoods may have an important effect in poverty transmission. For this reason, a location index has been created to reflect the opportunities that people may have according their neighborhoods. The index is defined from 1 to 5, where 1 is the more centrally located places and 5 corresponds to the rural areas of the periphery's departments of the country.
- Teenage pregnancy  
This variable is only defined for woman who had had a child before she reached the age of eighteen. The variable is only available for the second generation population.

#### **4. Methodology**

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The methodology mainly consists in two steps: calculate a multidimensional poverty measure and then estimate poverty inheritance using social mobility tools.

##### **A. Multidimensional poverty measurement**

On the first hand, it is critical to identify and aggregate the poor. Following the Alkire-Foster multidimensional poverty methodology with two cutoffs, a methodology for El Salvador has been designed using the available data of SMS survey (Alkire & Foster, 2011a). Three dimensions are used: education, household's condition and access to services. As summarized in Table 1, nine indicators will be applied to identify the poor. The poverty score is built using a weighted average of deprivations with equal weight across dimension and equal weight for each indicator within dimensions.

After identifying deprivations among people, it is important to count how many weighted deprivations each person may have. Finally, a second cutoff is defined to identify the poor; in this case it will be 30%, which means that a person will be defined as poor if he or she has more than 30% on the weighted sum of deprivations. A robustness test will be conducted to show that the ranking of generations' results are the same among different cutoffs (Alkire & Foster, 2011a).

When the identification process is completed, the Alkire-Foster's adjusted headcount ratio<sup>1</sup> ( $M_0 = H * A$ ) will be calculated using the headcount ratio (H) and the average deprivation share (A). The headcount ratio shows the percentage of population that is poor and the average deprivation share reveals the breadth of deprivation experienced by the poor (Alkire & Foster, 2011a)<sup>2</sup>

<b>Table 1: Dimensions, indicators, deprivation cutoffs and weights for El Salvador</b>			
<b>Dimension</b>	<b>Indicator</b>	<b>Deprivation cutoff</b>	<b>Indicator's weight<sup>3</sup></b>
Education	Illiteracy for adults (18 years old and more)	Person cannot read or write	1/6
	People with less than 6 years of schooling	Person has less than 6 years of schooling	1/6
Household's conditions	Roof material	The roof materials are eroded metal sheet or thatch or garbage	1/12
	Wall material	The wall materials are mud, bahareque, metal sheet, thatch or garbage	1/12
	Floor material	The floor material is mud.	1/12
	House type	Makeshift homes and inn's rooms	1/12
Access to services	Access to energy service	Individual doesn't have access to energy service	1/9
	Access to piped water service	Individual doesn't have access to piped water service	1/9
	Access to toilet	Individual doesn't have access to toilet	1/9
<b>Source:</b> Own elaboration based on UNDP (2014)			

## **B. Poverty Inheritance Framework (PIF)**

This paper will not offer one ideal measure for poverty inheritance, but it will offer a set of tools that can be used to have a better picture of poverty dynamics between generations. The main question that PIF answers is: "Does poverty is inherited from parents to children?" But in order to complete this research goal, PIF will answer seven specific questions about poverty inheritance using four types of tools. Table 2 describes the Poverty Inheritance Framework rationale that will be developed in this document. After table 2, each tool will be explained in detail.

<sup>1</sup> The adjusted headcount ratio is named  $M_0$

<sup>2</sup> For a complete review of Alkire-Foster methodology and its axioms see Alkire and Foster (2011) and Alkire et al. (2013)

<sup>3</sup> The indicator weight shows the relative importance of the indicator in the process of defining a poverty score.

<b>Table 2: Poverty Inheritance Framework (PIF) rationale</b>			
<b>Tool</b>	<b>Traditional purpose in social mobility analysis</b>	<b>Poverty inheritance analysis</b>	
		<b>PIF purpose</b>	<b>Question to be answered</b>
<b>Size transition matrixes</b>	Show how conditions have changed between generations. Incorporate the exchange of positions and the increasing availability of positions	Identify the poor according the deprivations that their parents may have.	1. Who are the poor that have poor parents?
<b>Quantile transition matrixes</b>	Offer information about the nature and direction of mobility. Show only the exchange of positions between people	Show the percentage of children who have not been able to overcome their destiny based on their parents' deprivation.	2. Who are the children with poor parents that have not overcome their destiny of being in the lowest quintiles?
<b>Relative rates of mobility</b>	Measure the degree of equality of opportunity	Measure the unequal upward mobility chances of children who have poor parents. Higher odds ratios mean a higher poverty persistence among generations	3. How large are the disadvantages that children with poor parents have in the competition for better positions in the deprivation distribution?
<b>Inter-generational transition probabilities</b>	Indicate the likelihood of making the transition between one quintile to another one.	Reveal the dynamics of deprivation distribution. Show access to the equal opportunity ideal.	4. What are the chances of a child with poor parents may reach the last three quintiles? 5. Is there a poverty trap in the distribution?
<b>Rank-rank estimates</b>	The regression coefficient shows the "association between a child's position in the income distribution and her parents' position" (Chetty et al., 2014)	Show the poverty inheritance effect. Allow to test other variables related to poverty inheritance	6. How large is the poverty inheritance effect? 7. What other variables may explain the child position in the deprivation distribution?

**Source:** Own elaboration



### C. Tools for the Poverty Inheritance Framework.

Following the theoretical framework discussed before, some social mobility tools will be adapted to show poverty inheritance from the first generation to the second generation using SMS survey data. The analysis will use 4 tools: transition matrixes definition, odds ratios estimation, intergenerational transition probabilities, and rank-rank estimates.

#### **Transition matrixes**

Transition matrices break down how conditions have changed between generations. Formby, Smith and Zheng (2004) assert that there are two types of transition matrices (Formby, Smith, & Zheng, 2004). The first type is called *size transition matrix* and it sets “exogenous boundaries between income classes”; they are convenient because reflects movements between different income or class levels and also incorporates into mobility both the “exchange of positions of individuals and the increasing availability of positions” (Formby et al., 2004).

The size transition matrix may be used to describe movements in and out of poverty. The poverty measurement’s cutoff may be the boundary between groups. In this case, the methodology will use a poverty cutoff of 30%. This matrix will show the percentage of children who have changed their destiny coming from a poor household.

The second type is called *quantile transition matrix* which is more used in relevant literature (see Shorrocks 1978; Formby et al. 2004; Torche 2014). After ordering observations using income or occupational status, the child and parent distributions may be divided in  $n$  equal-sized quantiles, in order to analyze movement between quantiles over a generation (Dearden et al., 2015). This approach gives more information about the nature and direction of mobility than the regression method (Dearden et al., 2015). However, “the quantile transition matrix cannot take into account whether overall income is increasing or decreasing” (Formby et al., 2004).

#### **Relative rates of mobility – Odds ratios**

The relative rates of mobility measure the association between class origins and class destinations (Erikson & Goldthorpe, 2002). According to Torche (2014), they “indicate the level of social fluidity or social openness or the degree of equality of opportunity in a society” (Torche, 2014). The relative rates are measured by odd ratios that gives the chances for an individual coming from class  $i$  being found in the same class instead of class  $j$ , relative to the same probability for an individual originating in class  $j$  (Goldthorpe & Jackson, 2007).

$$odds\ ratio = \frac{\frac{f_{ii}}{f_{ij}}}{\frac{f_{ji}}{f_{jj}}}$$

Where  $f_{ii}$  describes immobility within class  $i$ ,  $f_{ij}$  refers to mobility from class  $i$  to class  $j$ , and so on. The odds ratios may be used to “express the competition between people with different origins to attain diverse destinations” (Torche, 2014). Odds ratios will be helpful to understand the poverty persistence between generations. If odds ratios are close to one, they will reflect relative equality of opportunity that means there is no poverty inheritance effect among the population. In this case, with a matrix showing poverty condition instead of economic classes, if an odds ratio rises above one there is a poverty transmission from the first generation to the second one.

### Intergenerational transition probabilities

As a third step, it is important to understand the child's probability of falling or staying in poverty having poor parents. Those conditional probabilities indicate the likelihood of making the transition between one quintile to another one. Following Bowles and Gintis (2002) methodology, conditional probabilities may show a better picture of the inheritance of poverty because they offer more details of the distribution between generations (Bowles & Gintis, 2002). It will be shown that there are important differences in life trajectories when those are controlled by the parents' conditions. The analysis of conditional probabilities indicates where poverty traps are formed and how much access the children of poor parents will have to the equal opportunity ideal.

### Rank-rank specification

Children and parents' distributions may be ranked based on the mobility variable that is used. Following Chetty et al. (2014) methodology, this mobility measure is based on the slope of the rank-rank relationship (Chetty et al., 2014). Regressing child's rank on his parent's rank, the regression coefficient shows the "the association between a child's position in the income distribution and her parents' position" (Chetty et al., 2014)<sup>4</sup>. In this paper a ranking for each generation is created in the SMS survey based on the poverty score of each person. As was stated before, poverty score is not a continuous variable, and then some people in the same generation may have the same poverty score. In order to break ties, personal income and years of schooling were used in some cases.

Rank-rank estimates are built following a linear regression between children rank and mother or father rank. The main model is defined as follow:

$$R_i^{child} = \alpha + \beta R_i^{parent} + \varepsilon_i.$$

Where,  $R_i^{child}$  is the rank position in deprivations' distribution of child  $i$  and  $R_i^{parent}$  is the rank position of parent of child  $i$ .  $\beta$  is the slope from the regression and  $\varepsilon_i$  is an error term.

The rank-rank regression was conducted for a sub-sample of the households where the mother or father was identified as poor because the paper has a deprivation emphasis. This rank-rank regression may help to understand the main factors that contribute to poverty persistence. Some variables such as teenage pregnancy, location, number of children were used to control the effects.

### Double log transformation

Another measurement for social mobility is the intergenerational elasticity of income calculated with the regression between the log of a children's economic status and the log of the same measure of economic status for his or her parent (Dearden et al., 2015). However, this method will not be used because the poverty score is not a continuous variable and it concentrates values at the extremes of the distribution. When the log of the poverty score was calculated, 18% of the observations turned into a missing value, losing important information of the survey. Chetty et al. (2014) also found that this log-log specification offers unstable estimates of mobility in the case of the United States (Chetty et al., 2014).

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<sup>4</sup> The methodology allows to include observations with value equal to zero (Torche, 2014)

## 5. Results

### A. Multidimensional Poverty Measurement

Following the methodology discussed in the previous section, the multidimensional poverty measurement is applied for the first and second generations' data that is included in the SMS survey. Table 3 summarizes Headcount ratio and Average deprivation share results by generation and gender for a cutoff of 30%.

	Headcount ratio (cutoff=30%)		Average deprivation share	
	1st	2nd	1st	2nd
Men	69.6%	23.4%	62.2%	49.7%
Women	67.8%	29.6%	61.4%	48.8%
Total	68.7%	26.5%	61.8%	49.2%

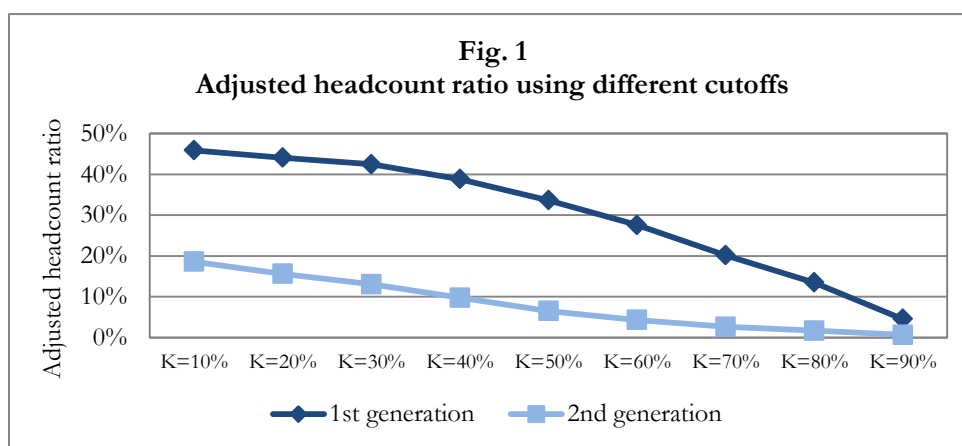
**Source:** Own elaboration based on SMS survey

Taking into consideration Alkire-Foster methodology, the adjusted headcount ratio is given by  $M_0 = H * A$ . Table 4 shows the results for the three generations and gender. The adjusted headcount ratio has declined between generations from a 42.5% in the first generation to 13.0% in the second generation.

	1st	2nd
Men	43.3%	11.6%
Women	41.6%	14.5%
Total	42.5%	13.0%

**Source:** Own elaboration based on SMS survey

Fig. 1 reports the different levels of the adjusted headcount ratio for cutoffs between 10% and 90%<sup>5</sup>. The results are robust because for each value of the cutoff the ranking of the three generations is the same.



<sup>5</sup> The same test was conducted in Alkire & Foster (2011a)

### B. Poverty Inheritance Framework

This subsection will conduct the Poverty Inheritance Framework and will offer answers for the seven research questions that were formulated in the last section.

#### Transition matrixes

After creating the multidimensional poverty measure, Poverty Inheritance Framework can be followed. On the first hand, transition matrixes have been built as summary statistics of how poverty is perpetuated among generations. The first type of matrixes is size transition matrixes where the boundary between groups is defined exogenously. Given the previous poverty cutoff of 30%, the following size matrixes will use this cutoff as boundary splitting each generation in poor or non-poor. Table 5 shows the size transition matrix for first and second generation using separately data from mothers and fathers. In the case of poverty transmission between mothers and children, 25.7% of the children with a poor mother have remained poor. Virtually the same result for fathers and children (25.6%)

Table 5: Size transition matrix for first and second generation (cutoff=30%)							
Mother (1 <sup>st</sup> gen)		Second generation		Father (1 <sup>st</sup> gen)		Second generation	
		Poor	Non-poor			Poor	Non-poor
	Poor	25.7%	43.9%		Poor	25.6%	42.2%
Non-poor	0.8%	29.6%	Non-poor	1.0%	31.3%		
The data for second generation includes both men and women							
Source: Own elaboration based on SMS survey							

A valid hypothesis is that the poverty transmission mechanisms are different between genders. Table 6 and 7 offers size transition matrixes classified by gender. For women, the poverty inheritance process is stronger than for men regardless of the parent's gender. 29.0% of the daughters of a poor mother remains poor but only 22.4% of sons of a poor mother remains poor.

Table 6: Size transition matrix for first and second generation (only men)							
Mother (1 <sup>st</sup> gen)		Son (2 <sup>nd</sup> gen)		Father (1 <sup>st</sup> gen)		Son (2 <sup>nd</sup> gen)	
		Poor	Non-poor			Poor	Non-poor
	Poor	22.4%	45.6%		Poor	22.2%	43.3%
Non-poor	1.0%	31.0%	Non-poor	1.1%	33.4%		
Source: Own elaboration based on SMS survey							

Table 7: Size transition matrix for first and second generation (only women)							
Mother (1 <sup>st</sup> gen)		Daughter (2 <sup>nd</sup> gen)		Father (1 <sup>st</sup> gen)		Daughter (2 <sup>nd</sup> gen)	
		Poor	Non-poor			Poor	Non-poor
	Poor	29.0%	42.2%		Poor	28.8%	41.2%
Non-poor	0.6%	28.2%	Non-poor	0.9%	29.2%		
Source: Own elaboration based on SMS survey							

Another way to build transition matrixes is using quintiles. In this case, each person of each generation has been arranged according to his or her poverty score. Instead of creating

income quintiles, the methodology creates “deprivation” quintiles where the most deprived people are located in quintile 1.

Table 8 show quintiles transition matrix classified by parent’s gender. Main diagonal reveals the percent of children that have remained in the same quintile of his mother or father. Cell (1,1) shows that 11% of children have not been able to overcome their destiny based on mother’s deprivations. In both matrixes, there is no one child that coming from the lowest deprivation quintiles have reached the fifth quintile in his generation.

<b>Table 8: Quintile transition matrix for first and second generation (Percentage)</b>													
		Children (2 <sup>nd</sup> gen)							Children (2 <sup>nd</sup> gen)				
		1	2	3	4	5			1	2	3	4	5
Mother (1 <sup>st</sup> gen)	1	11.0	4.8	2.6	1.5	0.0	Father (1 <sup>st</sup> gen)	1	11.2	4.7	2.2	1.8	0.0
	2	5.6	5.4	4.4	4.7	0.0		2	5.6	5.7	4.7	4.0	0.0
	3	2.7	5.8	5.2	6.0	0.2		3	2.4	5.3	5.3	7.0	0.0
	4	0.6	3.5	5.9	6.7	3.4		4	0.6	3.6	5.6	6.4	3.8
	5	0.1	0.6	1.8	1.1	16.4		5	0.1	0.8	2.1	0.8	16.2

**Source:** Own elaboration based on SMS survey

<b>Table 9: Summary statistics of quintile transition matrixes (Percentage of children)</b>		
	<b>Mother-Children</b>	<b>Father-Children</b>
Total mobility	55.3	55.1
Upward mobility	27.6	28.2
Downward mobility	27.7	26.9
Immobility	44.7	44.9
Children that have remained in the two lower quintiles <sup>6</sup>	26.8	27.3

**Source:** Own elaboration based on SMS survey

Table 9 calculates some summary statistics based on Table 7 and 8. Total mobility refers to the sum of cells where children are in a different quintile than their parents. The total mobility may be broken down in two estimates: upward mobility, when children get a higher quintile than their parents; and downward mobility, when children get a lower quintile than their parents.

Both types of mobility are, virtually, in a similar level. Immobility indicator adds the cells on the main diagonal of the quintile matrix. It shows the percentage of children in the same quintile than their mother or father. More than 36% of this immobility is explained by the least deprived families (quintile 5) which have retained their children in the same conditions. In addition, 26.8% of the children have not been able to improve their relative position in the distribution of their generation.

#### **Relative rates of mobility –Odds ratios**

The relative rates of mobility are estimated using odds ratios. In poverty inheritance context, when an odds ratio rises above 1 the positive association between parents’ and children’s deprivations is stronger. Using a deprivations distribution, odds ratio will measure the unequal mobility chances of children having their parents’ deprivation. Tables 10 and 11 calculate the odds ratios for the previous quintile transition matrixes (Table 8).

<sup>6</sup> Sum of cells (1,1), (1,2), (2,1) and (2,2)

Finding a way out of poverty is more complicated for children with their mother or father in the first quintile. For example, in the competition to move to the third quintile, the probability of a child with a mother in the third quintile is 8.1 times higher than the probability for a child with a mother in the first quintile. The odds ratios may show the unequal mobility opportunities for children with poverty inherited.

<b>Table 10: Symmetrical odds ratios for Mothers-Children transmission</b>					
		<b>Children (2<sup>nd</sup> gen)</b>			
		2	3	4	5
<b>Mother (1<sup>st</sup> gen)</b>	1	2.2	8.1	88.0	N.d. <sup>7</sup>
	2		1.1	2.2	N.d.
	3			1.0	189.1
	4				29.7
<b>Source:</b> Own elaboration based on SMS survey					

Retaking size transition matrixes data, a gender analysis can be conducted using odds ratios on deprivation distributions. Table 12 shows the odds ratios using the data coming from Table 5, 6 and 7. In this case, odds ratios will be used to compare the poverty inheritance effect among different populations. Using the cutoff of 30% of the poverty score, a child with a non-poor mother will have a probability of being non-poor 21.79 times higher than a child with a poor mother.

<b>Table 11: Symmetrical odds ratios for Fathers-Children transmissions</b>					
		<b>Children (2<sup>nd</sup> gen)</b>			
		2	3	4	5
<b>Father (1<sup>st</sup> gen)</b>	1	2.4	11.3	64.1	N.d.
	2		1.2	2.6	N.d.
	3			0.9	N.d.
	4				34.4
<b>Source:</b> Own elaboration based on SMS survey					

When poverty dynamics are analyzed by gender the results are significantly different. In the case of sons, they will have, virtually the same odd ratio independently of who is the source of poverty inheritance (mother or father). But, girls' poverty is highly determined by their mothers. In addition, in order to find a way out of poverty, girls will have a worse scenario. A girl with a non-poor mother will have a probability of being non-poor 31.96 times higher than a girl with a poor mother. The

stronger linkage in poverty inheritance between mothers and daughters should be taken into account by public policies in El Salvador.

<b>Table 12: Odds ratios for Tables 5, 6 and 7</b>				
		<b>2<sup>nd</sup> generation</b>		
		Children (total)	Sons	Daughters
<b>1<sup>st</sup> generation</b>	Mother	21.79	15.38	31.96
	Father	19.29	15.43	23.97
<b>Source:</b> Own elaboration based on SMS survey				

### Intergenerational transition probabilities

The conditional probabilities of being poor having a mother or father poor are critical to understand poverty inheritance process. Those conditional probabilities indicate the likelihood of making the transition between one quintile to another one. Tables 13 and 14 exhibit intergenerational transition probabilities for parents and children. The results are graphically exposed in Fig. 2 and Fig. 3. There are two peaks in both figures showing the

<sup>7</sup> N.d. means "Not defined". In this case indicates that odd ratio indicator tends to infinite.

children trapped in higher and lower levels of deprivation. A child with a quintile-one mother has 55.2 percent chance of be trapped in the same quintile.

Consequently, there are only 44.8 percent chance of improved its condition, where barely half of those chances means only a movement to quintile two. According to Bowles and Gintis (2002), there are different transmission mechanisms that work at different points of the distribution (Bowles & Gintis, 2002). In El Salvador case, the dissimilarities between behavior of the intergenerational transition probabilities stress that different distribution's sections may be studied in a different way. Average mobility doesn't say anything about poverty or wealth traps. For this reason, a combination of social mobility tools is required when research project is designed.

In Table 13 and 14, there are three distribution's sections that should be analyzed separately, because they have a different behavior. The first section may be called "poverty trap" and it is characterized by a higher probability to be trapped in the section having a poor parent. The second section can reflect the reality of a middle class where an improvement in personal deprivations is possible and it is attainable. The third section will reflect a "wealth trap" where if a child was born rich, he will have a high probability of stay rich in his life.

Table 13: Intergenerational transition probabilities (percentage) <sup>8</sup>						
		Children (2 <sup>nd</sup> gen)				
		1	2	3	4	5
Mother (1 <sup>st</sup> gen)	1	55.2	23.9	13.2	7.7	0.0
	2	27.8	26.9	22.0	23.2	0.0
	3	13.5	29.1	26.1	30.1	1.2
	4	2.8	17.4	29.4	33.6	16.8
	5	0.6	2.8	9.2	5.5	81.9

**Source:** Own elaboration based on SMS survey

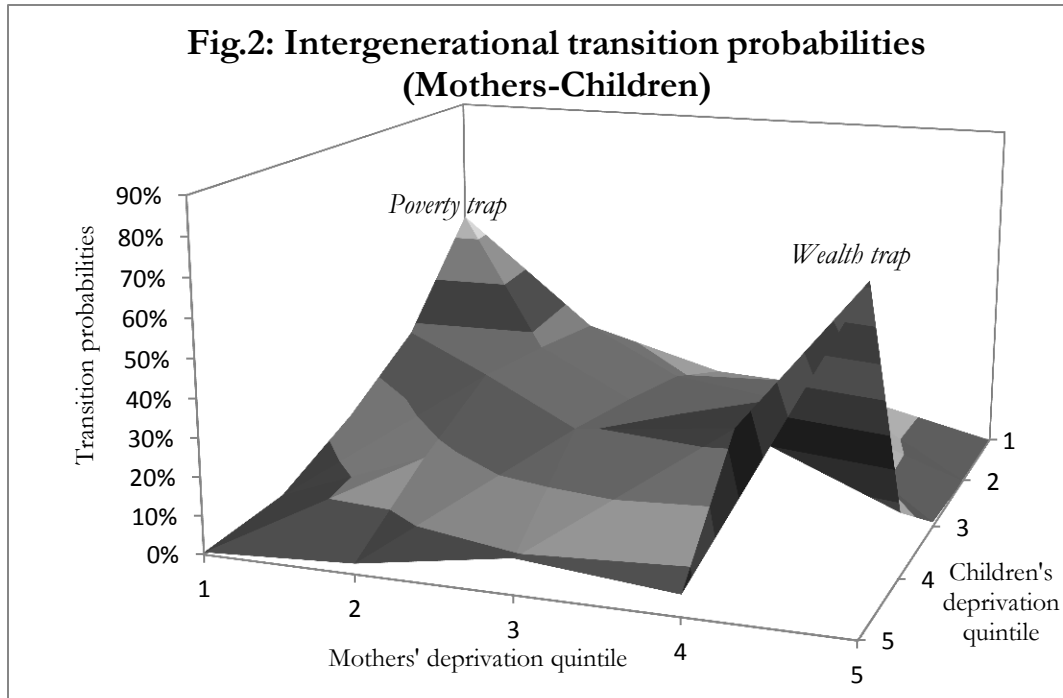
Table 14: Intergenerational transition probabilities (percentage)						
		Children (2 <sup>nd</sup> gen)				
		1	2	3	4	5
Father (1 <sup>st</sup> gen)	1	56.1	23.6	11.0	9.2	0.0
	2	28.1	28.4	23.5	19.9	0.0
	3	12.0	26.4	26.7	35.0	0.0
	4	3.1	17.7	28.1	32.1	19.0
	5	0.6	4.0	10.4	4.0	81.0

**Source:** Own elaboration based on SMS survey

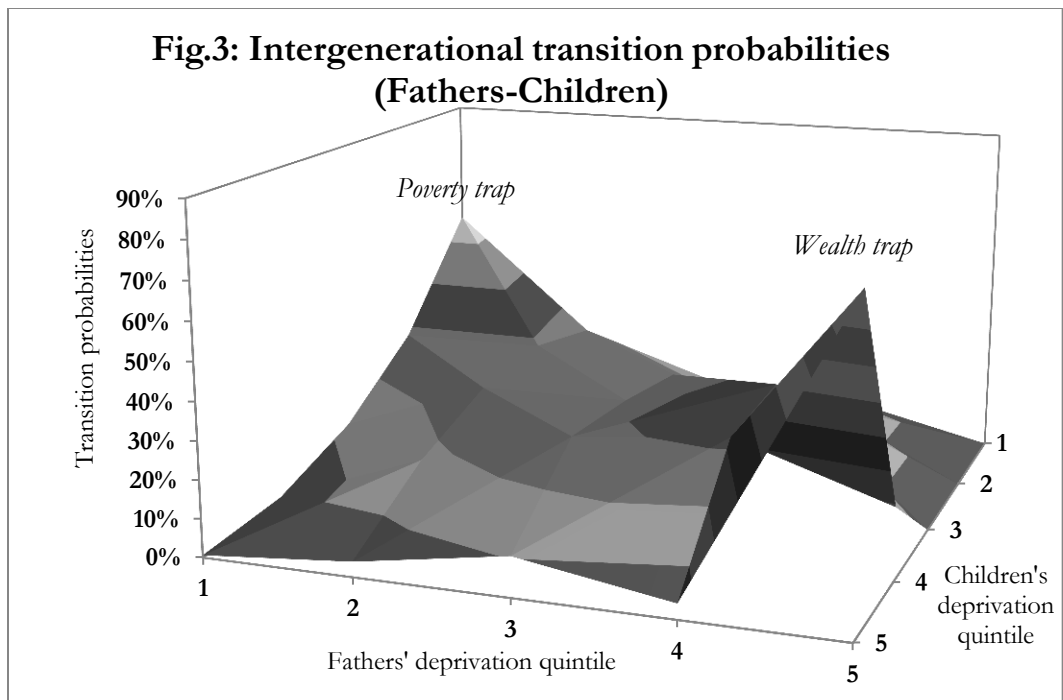
The poverty trap is the main concern in this research project. Having a mother (or a father) in the first quintile of deprivations it will condemned children to only have a 20.9 percent chance (20.2% in the case of father's quintile) of moving to a higher quintile. Only the children with mothers and fathers in the last three quintiles will have a higher chance of

<sup>8</sup> Dark blue shaded area shows the location of a poverty trap. Gray shaded area shows the "middle class" and light blue shaded area shows a wealth trap.

having a better access (not perfect) to the equal opportunity ideal, where origins do not condemned destinations.



Source: Own elaboration based on SMS survey<sup>9</sup>



Source: Own elaboration based on SMS survey

<sup>9</sup> Quintile 1 represents the people group that is more deprived.



### Rank-rank estimates

The last tool used in the Poverty Inheritance Framework is a rank-rank regression where each generation has its own rank based on each person's poverty score. In order to break ties, personal income and years of schooling were used in some cases as was discussed in methodology section.

On the first hand, the rank-rank model has been used for the core sample including each person independently of his poverty condition; the results are showed in Table 15. The slope estimates are generally similar across subsamples using either mothers' or fathers' rank.

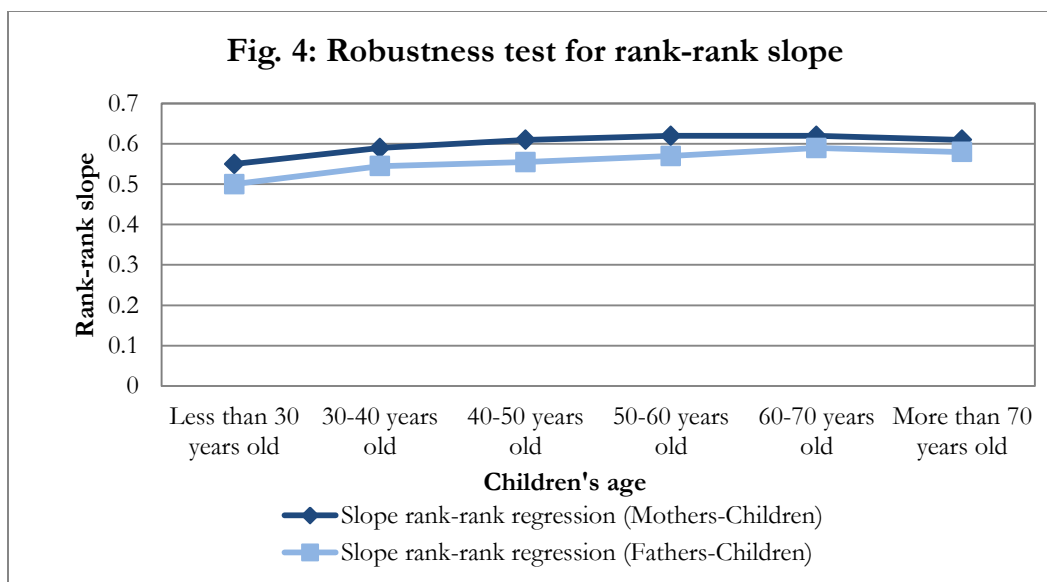
<b>Table 15: Rank-rank regressions over complete SMS survey</b>						
	<b>Mothers</b>			<b>Fathers</b>		
	<b>Total</b>	<b>Sons</b>	<b>Daughters</b>	<b>Total</b>	<b>Sons</b>	<b>Daughters</b>
Slope	0.6181 (0.000)	0.5993 (0.000)	0.6349 (0.000)	0.6123 (0.000)	0.5955 (0.000)	0.6268 (0.000)
N <sup>10</sup>	1482	744	738	1310	663	647
R-squared	0.3821	0.3767	0.3874	0.3749	0.3744	0.3746
<b>Source:</b> Own elaboration based on SMS survey						

After using the rank-rank relationship for all the SMS survey's observations, now it is important to focus on the poor. Table 16, 17 and 18 shows the results for a sub-sample of the households where the mother or father was identified as poor. Using the same cutoff of 30% as above, Table 16 illustrates the slopes for each subsample according to gender. For each case, parent rank is a significant variable explaining children rank. The slope reveals how poverty is inherited between generations. The children rank position among deprivations' distribution is partly explained by their parents rank.

<b>Table 16: Rank-rank regressions over poor parents sample (poverty cutoff=30%)</b>						
	<b>Mothers</b>			<b>Fathers</b>		
	<b>Total</b>	<b>Sons</b>	<b>Daughters</b>	<b>Total</b>	<b>Sons</b>	<b>Daughters</b>
Slope	0.5781 (0.000)	0.5822 (0.000)	0.5751 (0.000)	0.5285 (0.000)	0.5395 (0.000)	0.5170 (0.000)
N	1036	505	531	901	440	461
R-squared	0.1887	0.1948	0.1856	0.1785	0.1902	0.1691
<b>Source:</b> Own elaboration based on SMS survey						

The literature has suggested that the slope of the rank-rank regression may be biased because children may have "steeper earnings profile when they are young"(Chetty et al., 2014). In order to ensure slope's robustness, the rank-rank regressions have been calculated for each age of children group (second generation); following Chetty et al. (2014) test for the rank-rank slope for the sub-samples of the households where the mother or father was identified as poor. However, using the deprivation's distribution, the slope of rank-rank regression seems to be robust because independently the age of the second generation's person, the slope seems to be similar; final results are shown in Fig. 4.

<sup>10</sup> "N" is the number of observations in the sample and sub-sample



**Source:** Own elaboration based on SMS survey

Finally, the rank-rank model will be controlled for some variables that prior research have identified as relevant when poverty inheritance is calculated. Table 17 describes the different specifications of rank-rank model using mothers rank as predictor, while Table 18 describes specifications using fathers rank. The first model (1) controls the relationship between mothers and children rank using the location index. A higher location index means a lower quality of neighborhood<sup>11</sup>. Therefore, an increase of one unit in location index will reduce the child deprivation's rank position<sup>12</sup>. This linkage is held in all the specifications of the model, as an example, model (5) repeats the same specification in (1) but using fathers rank.

The second model (2) adds the last grade approved by children. Although the slope of this variable is statistically significant, it introduces a bias on rank-rank slope because children rank is highly correlated with this variable. For this reason, the variable is not used in other specifications.

The third rank-rank specification (3) is based on the mothers-daughters relationship. In this case, the regression is controlled by the variable that captures if the child abandoned her family household before 18 years old. The variable is statistically significant showing that leaving the family household may reduce the child rank. This variable is only relevant in the mothers-daughters relationship. Model (6) demonstrates that for the case of fathers-sons the variable is not significant.

The fourth model (4) is based on mothers-daughters relationship, too. A pregnancy before 18 years old may reduce a child rank by 174.37 positions. The variable is statistically-significant in each mothers-daughters specification; it is also relevant in fathers-daughters relationship as it is shown on models (7) and (8).

<sup>11</sup> For further details review the variables definitions section.

<sup>12</sup> A decrease in a child deprivation's rank position means that now he is more deprived than before.

Other variables were tested such as number of children, marital status, any negative shock before 18 years old<sup>13</sup>, and unemployment. None of them was statistically significant for any model specification.

<b>Table 17: Rank-rank model specifications for mothers rank data</b>				
	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>
Rank-rank slope (mothers rank)	0.5154 (0.000)	0.1745 (0.000)	0.5437 (0.000)	0.5578 (0.000)
Location index	-58.26 (0.000)	-48.81 (0.000)		
Abandon family household before 18 years old			-132.08 (0.000)	
Last grade approved by children		64.99 (0.000)		
Pregnancy before 18 years old				-174.37 (0.000)
N	1036	1036	531	531
R-squared	0.2301	0.5646	0.2041	0.2177
Own elaboration based on SMS survey				

<b>Table 18: Rank-rank model specifications for fathers rank data</b>				
	<b>(5)</b>	<b>(6)</b>	<b>(7)</b>	<b>(8)</b>
Rank-rank slope (mothers rank)	0.4655 (0.000)	0.5378 (0.000)	0.5026 (0.000)	0.4579 (0.000)
Location index	-57.17 (0.000)			-49.90 (0.000)
Left home before 18 years old		-43.16 (0.330)		
Last grade approved by children				
Pregnancy before 18 years old			-179.67 (0.000)	-174.02 (0.000)
N	901	440	461	461
R-squared	0.2181	0.1916	0.2033	0.2351
<b>Source:</b> Own elaboration based on SMS survey				

Finally, for any specification of rank-rank model, the rank position of mothers or fathers was relevant to explain the rank position of children. After completing the four tools of PIF's analysis, there is no doubt that, using the SMS survey, poverty inheritance effect is statistically significant.

<sup>13</sup> The survey includes a question about shocks before 18 years old such as parent death, injury or disease.

## 6. Final remarks

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After conducting PIF methodology, there is strong evidence that parents' poverty influence children's poverty in El Salvador. The higher association between parents' and children's deprivations demonstrated in this paper shows that children with poor parents have a lower access to the equal opportunity ideal that Capability approach promotes.

Using SMS survey data, PIF methodology found that at least 26% of children who have poor parents have not overcome their destiny of being poor. It also demonstrated that the disadvantages that children with poor parents have in competition for better positions in the deprivation distribution are strong. For example, in the competition to move to the third quintile, the probability of a child with a mother in the first quintile is 8.1 times lower than the probability for a child with a mother in the third quintile.

In addition, PIF analysis concluded that inheritance of poverty has a gender component. A girl destination is more influenced by their mothers. A girl with a poor mother will have a probability of being non-poor 31.96 times lower than a girl with a non-poor mother.

This paper also demonstrates that average mobility measures hide important information about the ends of the distribution. Certainly, the degree of intergenerational social mobility depends on the origins position. In El Salvador's case, the likelihood of making transitions between quintiles is influenced by the position of the child, which means if he is on a poverty trap, middle class or on a wealth trap. Having a mother (or a father) in the first quintile of deprivations it will condemned children to only have a 20.9% percent chance (20.2% in father's case) of finding a way out of poverty.

Moreover, rank-rank models demonstrated that poverty inheritance exists and it is important when children's rank positions are estimated. Other variables that explain the children's rank position are location, and pregnancy before 18 years old. The location is a proxy of access to jobs that people in rural areas may not have. Pregnancies before 18 years old may force girls to drop out of high school and reduce their future opportunities.

To sum up, public policies can no longer make additional progress in reducing poverty using static indicators. In order to tackle poverty in developing countries, policymakers should start to think about poverty dynamics instead of only alleviation programs. The linkage between parents and children's deprivations in El Salvador is strong; therefore, a broader perspective of poverty is required. In this line, prevention policies should be used in order to ease the poverty conditions that parents inherit to their children.

## 7. References

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- Alkire, S. (2005). Why the Capability Approach? *Journal of Human Development*, 6(1), 115–135. <http://doi.org/10.1080/146498805200034275>
- Alkire, S., & Foster, J. (2011a). Counting and multidimensional poverty measurement, 95, 476–487. <http://doi.org/10.1016/j.jpubeco.2010.11.006>
- Alkire, S., & Foster, J. (2011b). Understandings and misunderstandings of multidimensional poverty measurement, 289–314. <http://doi.org/10.1007/s10888-011-9181-4>
- Anand, S., & Sen, A. (1997). Concepts of Human Development and Poverty: A Multidimensional Perspective. *Human Development Papers 1997*.
- Baulch, B., & Hoddinott, J. (2000). Economic mobility and poverty dynamics in developing countries. *Journal of Development Studies*, 36(6), 1–24. <http://doi.org/10.1080/00220380008422652>
- Bowles, S., & Gintis, H. (2002). *The Inheritance of Inequality*. *Journal of Economic Perspectives*.
- Chetty, B. R., Hendren, N., Kline, P., Saez, E., & Turner, N. (2014). Is the United States Still a Land of Opportunity? *Recent Trends in Intergenerational Mobility*, 104(5), 141–147.
- Cooper, E. (2010). Working Paper Inheritance and the Intergenerational Transmission of Poverty in Sub-Saharan Africa : Policy Considerations.
- Corcoran, M. (1995). *Rags to rags: Poverty and Mobility in the United States*. Michigan: Annual Review of Sociology.
- Dearden, L., Machin, S., Reed, H., The, S., Journal, E., & Jan, N. (2015). Intergenerational mobility in Britain, 107(440), 47–66.
- Erikson, R., & Goldthorpe, J. H. (2002). American Economic Association Intergenerational Inequality: A Sociological Perspective. *Journal of Economic Perspectives*, 16(3), 31–44. Retrieved from <http://www.jstor.org/stable/3216948>
- Formby, J. P., Smith, W. J., & Zheng, B. (2004). Mobility measurement, transition matrices and statistical inference. *Journal of Econometrics*, 120(1), 181–205. [http://doi.org/10.1016/S0304-4076\(03\)00211-2](http://doi.org/10.1016/S0304-4076(03)00211-2)
- Goldthorpe, J. H., & Jackson, M. (2007). Intergenerational class mobility in contemporary Britain: Political concerns and empirical findings. *British Journal of Sociology*, 58(4), 525–546. <http://doi.org/10.1111/j.1468-4446.2007.00165.x>
- Johnson, P., & Reed, H. (1996). *Two nations? The inheritance of poverty and affluence*. London: Institute for Fiscal Studies.

- Musick, K., & Mare, R. D. (2006). Recent trends in the inheritance of poverty and family structure *q*, 35, 471–499. <http://doi.org/10.1016/j.ssresearch.2004.11.006>
- Ng, I. Y. H. (2013). Education and intergenerational mobility in Singapore. *Educational Review*, 66(3), 362–376. <http://doi.org/10.1080/00131911.2013.780008>
- Nussbaum, M. (2011). *Creating Capabilities: The Human Development Approach*. Harvard University Press.
- Ravallion, M. (1996). Issues in Measuring and Modelling Poverty. *Cambridge: The Economic Journal*.
- Sen, A. K. (1976). Poverty: An Ordinal Approach to Measurement. *The Econometric Society*, 44(2), 219–231. <http://doi.org/10.2307/1912718>
- Torche, F. (2014). Analyses of Intergenerational Mobility: An Interdisciplinary Review. *The ANNALS of the American Academy of Political and Social Science*, 657(1), 37–62. <http://doi.org/10.1177/0002716214547476>
- UNDP. (2014). "Poverty in El Salvador: From the standpoint of its main characters). *La Libertad*.
- UNDP. (2014). *Poverty in El Salvador: From the stares of its protagonists*. San Salvador: UNDP.
- UNDP El Salvador. (2013). *Human Development Report 2013: Imagine a new country, make it possible*. San Salvador.