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Living on the Edge

Vulnerability to Poverty and Public Transfers in Mexico

Alejandro de la Fuente
Eduardo Ortiz-Juárez
Carlos Rodríguez-Castelán

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Abstract

Social policy in Mexico has focused on identifying and supporting chronically poor households. Yet, Mexico has a significant number of households that are just above the poverty line who are not eligible, by definition, for antipoverty programs and are at risk of falling back into poverty in the event of an economic crisis or shocks like loss of employment and natural disasters. These shocks can have serious negative effects on welfare in the absence of social safety nets targeted to these households. This study uses household survey data to better understand these "vulnerable" households, including their profile and risk exposure and, more importantly, to document the extent to which these households are covered by public transfers and insurance mechanisms. The analysis shows that until 2010 most social programs, including the few with productive components, such as vocational training and productive investment grants, barely covered the vulnerable. The study concludes that public policies need to pay attention to the vulnerable households and find the right policy mix between targeted interventions and universal insurance schemes to serve this economic group.

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Living on the Edge: Vulnerability to Poverty and Public Transfers in Mexico*

Alejandro de la Fuente† Eduardo Ortiz-Juárez‡ Carlos Rodríguez-Castelán§

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† Senior Economist in the Poverty Global Practice at the World Bank (adelafuente@worldbank.org). Corresponding author.
‡ Economist in the UNDP's Regional Bureau for Latin America and the Caribbean (eduardo.ortiz@undp.org).
§ Senior Economist in the Poverty Global Practice at the World Bank (crodriguezc@worldbank.org).

1. Introduction

Individuals and societies as a whole face multiple risks, including macroeconomic crisis, extreme climate-related events,[1] disease, accidents and death, and crime and violence and these can all have pernicious consequences for the poor and non-poor alike. Risks turned into shocks[2] could potentially lead to asset loss, disinvestment, unemployment, malnutrition, negative investments in human capital and child labor, when people lack safety nets and insurance. There is a large body of literature which shows that transitory shocks can have permanent effects on the welfare of households (See Baez, de la Fuente and Santos, 2010 for a review); for instance, after a shock occurs and during economic crisis investments in human capital are jeopardized and this has long lasting consequences (Grosh et al., 2008). In particular, risks combined with low to null access to adequate financial and social insurance could drive households into permanent destitution by means of reducing their levels of asset holdings below a "critical threshold" (Carter and Barrett, 2006). Risk avoidance in livelihood activities appears to add further to long-term poverty effects, as the fear of crises results in relative specialization in more low risk, low return activities, assets and technologies (Rosenzweig and Binswanger, 1993; Kurosaki and Fafchamps, 2000; Dercon and Christiaensen, 2011). Thus, a fundamental question for policy makers and international organizations focused on poverty mitigation is how to target scarcer resources to better protect poor and vulnerable households against risks.

Distinguished from *risk*, which refers to possibly occurring events that can damage welfare (Dercon, 2001), *vulnerability* can be understood as the capacity to manage the realization of such risk. This capacity will, in turn, eventually determine how liable individuals or households are to poverty. Vulnerability could then be understood as the magnitude of the threat to future poverty that a household experiences at a given point in time due to the potential realization of risk, given other more permanent disadvantages within households or the communities where those concerned reside. In this sense, it is an ex-ante, forward-looking measure. In addition to the likelihood of experiencing poverty, vulnerability encompasses the sense of insecurity that results from being exposed to risks and at the same time being (or perceiving oneself to be) defenseless against it (de la Fuente, 2009).

A robust comprehension, and therefore, a better use of the concept of vulnerability to poverty would be helpful for several reasons. First, because it could help us to assess the likelihood of households falling into poverty in any given place or territory, and, more importantly, to understand the factors underpinning this likelihood. This understanding, in turn, would facilitate the design of

[1] The terms climate-related events and natural disaster would be used interchangeably, understanding that socioeconomic conditions play a role to explain the intensity and consequences of such phenomena. Thus, no event is strictly or exclusively natural.

[2] Risk is often differentiated from shocks (risk realizations) to emphasize that risk can negatively impact on welfare through the 'lack of peace of mind' that being exposed to risk entails and through the adoption of (sub-optimal) activities to avoid or limit its impact in case it occurs. Shocks, for their part, can affect welfare given the imperfections of the available mechanisms to cope with them. Most of the time, this document will use the terms risks and shocks interchangeably to refer to realized risks.

forward-looking anti-poverty interventions, including the implementation of preventive measures to avoid or reduce risks. Second, a clear understanding of the concept could also improve our knowledge of how to provide more security to people so that they can accumulate and retain assets and avoid irreversible damage when they are faced with risks, while simultaneously protecting their incomes against sudden drops. Finally, it seems desirable, necessary indeed, to embrace the concept of vulnerability to poverty without ignoring the subjective sense of insecurity that vulnerability also implies (de la Fuente, 2009).

Vulnerability to poverty is a particularly relevant issue in Latin America and the Caribbean (LAC). Since 2003, the region has achieved steady and dramatic declines in poverty, cutting extreme poverty (living with less than $2.5 a day) by half to 12.3 percent in 2012. Over the same period, moderate poverty (defined as life with less than $4 a day) in LAC fell from about 42 percent to 25.3 percent in 2012 (World Bank, 2014). Despite these impressive gains, about two out of five Latin Americans remain vulnerable to falling back into poverty, making it the largest economic class in the region in 2012.[3] As in the case of the LAC region and most of its peers, Mexico has also made laudable progress on the poverty reduction front since the early 2000s. Moderate poverty has declined by 18 percentage points (from 40.1 to 22.2 percent) during 2000-12, and since 2006 the number of people in the middle class has been higher than the number of people in poverty. Despite these gains, about 43 percent of Mexicans remained vulnerable to falling into poverty in 2012, becoming the biggest economic group in Mexico.

In Mexico, the study and analysis of vulnerability to poverty has been partially taken in social-policy public and academic circles through exploring the nexus between poverty and risk. The major social and economic crisis of the mid-1990s (and then again the 2009 crisis) intensified the need to address issues of risk, which had perhaps been underrated in the past, as well as to put in place mechanisms to help the poor cope with adverse shocks, including macroeconomic crises. Social-security and social assistance programs in combination with insurance and appropriate risk management instruments were conceived as key components in a new agenda for combating poverty and fostering shared prosperity to promote and enhance social inclusion. However, this interest has not been followed by an identification of the vulnerable households, or any robust analysis assessing fluctuations in the living standards of these groups of households over time, and simultaneously tracking both the consequences of risk events on these groups and public responses to them. The main contribution of this paper to the existing literature is therefore to identify those households vulnerable to poverty at a national scale and provide a deeper understanding of this group, including their profile and risk exposure. With the identification of vulnerable households at a national scale it is also possible to explore the incidence of various social protection programs on the vulnerable and

[3] World Bank (2013, 2014). Calculations using SEDLAC data (CEDLAS and the World Bank). Estimates of poverty, vulnerability and the middle class at the regional level are population-weighted averages of country estimates. The poor are those living on less than $4 a day, the vulnerable are those living on $4 to $10 a day, and the middle class are those living on $10 to $50 a day (all in 2005 purchasing power parity). In order to analyze the same set of countries every year, interpolation was applied when country data was not available for a given year. Unless otherwise stated, all per capita figures are expressed in dollars per day based on purchasing power parity.

other groups in Mexico. Thus the second contribution of this paper is to show the extent to which vulnerable households are covered by social safety nets, in the form of public transfers, and social insurance, but more importantly to what extent these safety nets protect the vulnerable population from potential risks.

The rest of the paper is organized as follows. Section 2 defines the concept of vulnerability to poverty. It then sets out the measure and methods employed to assess this concept. Section 3 discusses the relevance of the topic in Mexico, and characterizes the magnitude, evolution and traits of the vulnerable population in the country over the past decade. Section 4 explores the incidence of various social protection programs on the vulnerable and other groups in Mexico. Finally, section 5 concludes.

2. Vulnerability to poverty: Definition and estimation

2.1 Definition and measurement

The notion of vulnerability in this paper aims to identify households at risk of poverty in the future, based on their current standing, so that it is an ex-ante, forward-looking measure. While the concept of vulnerability could be easy to state, the question remains on how to measure it and how to quantify its impacts on welfare.[4] Various approaches have been proposed to define and obtain explicit quantitative outcome-based measures of vulnerability. Thus far these efforts have followed different paths showing that there is still no definitive agreement on how to do so. However, at least there is a consensus around the fact that, at the minimum, the concept should be able to capture that 'something bad can happen and spell ruin' for the household (Calvo and Dercon, 2008). In a more formal sense, Hoddinott and Quisumbing (2010) state that this consensus has translated into a conceptualization that includes expectations about future welfare levels and some benchmark (i.e. a poverty line) against which one can tell if, in fact, that something that has happened was bad or not for the household.

To meet this end, some authors have adopted expected utility frameworks. They construct prediction models that define vulnerability as low expected utility and thus introduce the role of risk explicitly into welfare considerations (Ligon and Schechter, 2003; Elbers and Gunning, 2003). Others have focused on variations that are welfare-damaging (i.e. downside risk) through the construction of prediction models that give the probability of becoming poor in the future (Ravallion, 1988; Christiaensen and Boisvert, 2000; Pritchett et al., 2000; Chaudhuri et al., 2002; Chaudhuri and Datt, 2001; Kamanou and Morduch, 2002; Christiaensen and Subbarao, 2004). This latter group of applications have been based mainly in the adoption of the Foster-Greer-Thorbecke family of poverty indices (Foster et al., 1984, 2010) widely used for poverty assessments, and then

[4] Some studies have invoked the concept of vulnerability while trying to establish whether households are vulnerable to shocks as determined by the variability in their consumption: those households whose consumption is more sensitive to income shocks being considered more vulnerable. Indeed, most if not all the quantitative works on vulnerability in (rural) Mexico define vulnerability under these terms (Glewwe and Hall, 1998; Cunningham and Maloney, 2000; Mckenzie, 2003; Skoufias, 2006, 2007; Bando and Lopez-Calva, 2004; Rubio and Soloaga, 2004).

estimating their expected value; which they claim are more easily interpreted and exposited than the utility-based measures.

Along this strand, Cafiero and Vakis (2006) have suggested an approach based on an "augmented" poverty line, which in addition to including basic consumption goods and services it incorporates a basic "basket of insurance" against risks. In this line, Lopez-Calva and Ortiz-Juarez (2014) argue that it is possible to find the income level associated with a set of assets and socioeconomic characteristics that would allow the households to be less vulnerable to fall into poverty due to idiosyncratic and asymmetric shocks, and interpret it as an "augmented" poverty line. From that perspective, they explore the link between income and vulnerability to poverty in Mexico.[5] This paper follows their procedure, summarized in next section.

No single best approach exists to measure vulnerability (Ligon and Schechter, 2004). So far, different measures and approaches to estimate vulnerability have been proposed, depending on the priorities of the researcher and on nature of the data (along with the opportunities and problems it carries over). The proposed definition by Lopez-Calva and Ortiz-Juarez (2014) employed in this paper does at least conform to the widespread sense of what the nature of the concept of vulnerability should be.

2.2. Estimation

The vulnerability-to-poverty estimates (as an approach to middle classes) were constructed in three stages as follows. The first stage exploited longitudinal data to analyze movements in and out of poverty during 2002-05 using the international poverty line of $4 a day. The data were taken from the *Mexican Family Life Survey* (MxFLS) for the rounds of 2002 and 2005 with representativeness at the national, regional, urban and rural levels. The first wave includes 8,440 households, while the second includes 7,572 of the original households (attrition rate of 10%); however, only 6,129 households reported income in both waves. These datasets allowed to construct poverty transition matrices of households classified into four categories: 1) *never poor*, if a household never felt under the poverty line during 2002-05; 2) *always poor*, if it was poor in both years; 3) *out of poverty*, if it was poor in 2002, but exited poverty in 2005; and 4) *entered poverty*, if it was non-poor in 2002 but fell into poverty in 2005.

These transitions were used in a second stage to estimate probabilities of falling into poverty through logistic models identifying actual characteristics associated with movements in or out of poverty. The observable characteristics included demographic indicators, labor market resources, and self-reported shocks affecting the household—such as death, illness or accident of any

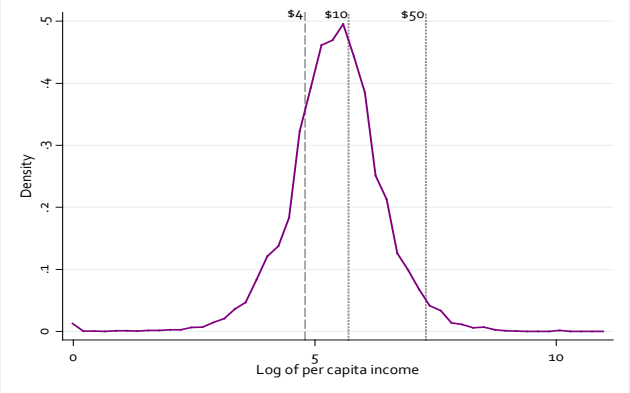
[5] For rural Mexico, de la Fuente (2009) tried, in an eclectic fashion, to bring together core elements from various approaches that have been proposed to define and obtain explicit quantitative outcome-based measures of vulnerability, that is, adopting of a normative, welfarist, utility-based approach to measure vulnerability, but taking into account some kind of threshold like the poverty line employed by the FGT measures, so that higher levels of consumption above a given welfare threshold do not increase vulnerability.

household member, unemployment and bankruptcy of business, and the loss of housing, business, crop and livestock due to climate-related events.

The third stage constructs income levels associated with the probabilities of falling into poverty using the same independent variables as in the previous step. For this purpose, the average of the independent variables gets calculated for an array of estimated probabilities of falling into poverty. The resulting coefficients were then used to produce the predicted income associated to each probability—a mean, conditional on characteristics, with lower volatility than the observed average income (Lopez-Calva and Ortiz-Juarez, 2014). Based on these models, the methodology yields monetary estimates expressed in PPP terms.

The authors proposed a 10% probability of falling into poverty as a dividing line between economic security and vulnerability, and defined the predicted income associated to that probability as the upper bound of vulnerability—or the lower bound for the middle class—with the lower bound being the $4 a day poverty line. The resulting per capita incomes for non-poor individuals with a 10% probability of falling into poverty was $9.8. Thus, a household is defined as vulnerable if it faces a more than 10 percent likelihood of falling back into poverty, which is equivalent to living on $4-10 a day. Figure 1 shows the distribution of income in Mexico in 2012 and the dividing lines for the identified groups under this methodology. A recent report lead by Ferreira et al. (2013) carried out a "validation" of the threshold by looking at income levels that are consistent with self-perceptions of middle class status, showing that $10 a day corresponds to the lower envelope of such income levels.

Figure 1: Distribution of income; Mexico 2012



Source: Author's estimations based on ENIGH 2012

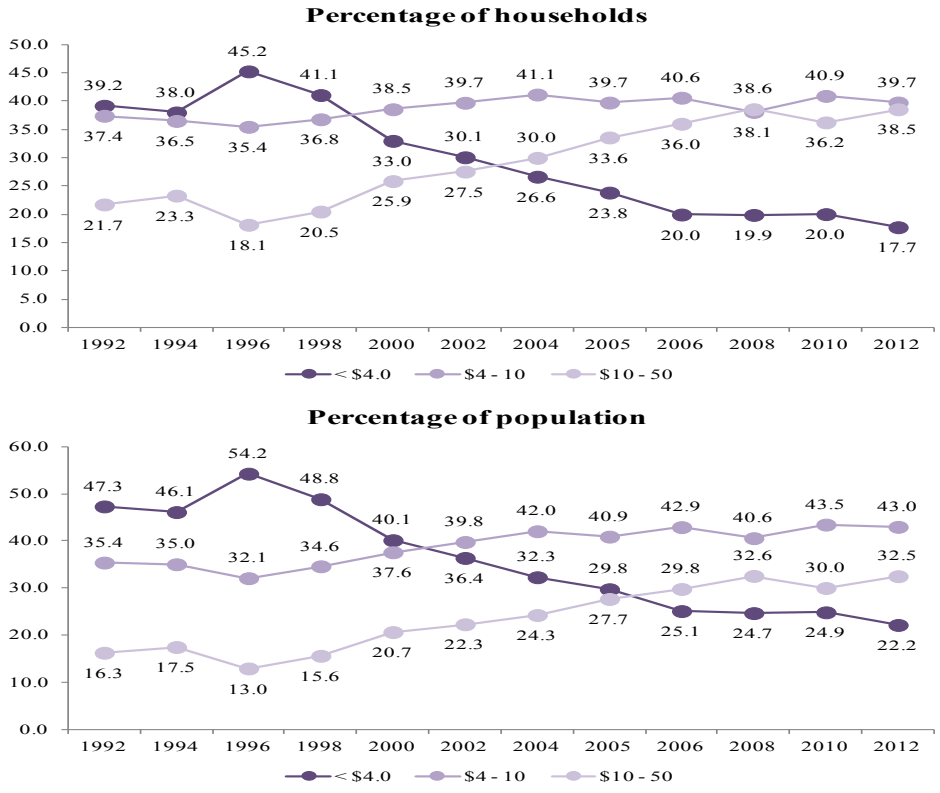
The resulting incomes are then applied to the National Household Income and Expenditure Survey (ENIGH), which are regularly used to assess poverty in the country. The ENIGH survey is undertaken by the Institute of Statistics and Geography (INEGI), and it is a nationally representative survey, covering urban and rural areas, which contains detailed information on income (including direct transfers), different categories of expenditures (after taxes), and in-kind transfers. This survey is available for 1984 and 1989, and for every 2 years since 1992. In order to measure the size of the

vulnerable population (along with other social groups, as in Figure 1), we use the surveys covering the period 1992-2012. To assess the coverage of public transfers on the same population, we employ the Module of Social Programs data commissioned by the Mexican Ministry of Social Development (SEDESOL) as part of the ENIGH for 2002, 2004, 2006 and 2010.

3. Why vulnerability to poverty matters in Mexico

Mexico, as many other countries in LAC, has made laudable progress in the last decade in reducing poverty and widening the middle class. Poverty has declined by 18 percentage points (from 40.1 to 22.2 percent) during 2000-12 (Figure 2). And since the early 2000s Mexico has had more people in the middle class ($10 to $50 a day) than in poverty (less than $4 a day) (World Bank, 2013; World Bank, 2014).

Figure 2: Size of the socioeconomic groups in Mexico *(Percentages)*



Source: Author's estimations based on ENIGH 1992-2012. Estimations are based on the net per capita income definition, used by Coneval for income poverty measurement in Mexico.

However, poverty reduction after 2006 has been stagnant. Particularly, the long-run trend of declining poverty rates using the $4 a day line in Mexico stopped between 2006 and 2008 when poverty rates moved from 25.1 to 24.7 percent and then to 24.9 percent in 2010, although there may

be signals of an improvement since the last recorded poverty rate from 2012 was 22.2 percent. Furthermore, most of those Mexicans who have escaped poverty did not enter the middle class, but rather moved into the group vulnerable to fall back into poverty ($4 to $10 a day). Data from the longitudinal MxFLS described in section 2.2 shows that from those households that moved out of poverty by 2005 more than a third turned into vulnerable (Table 1) Indeed, despite recent social progress in Mexico, about 43 percent of Mexicans remain vulnerable to fall into poverty by 2012 (see Figure 2 above).

Table 1. Transition matrix of socioeconomic groups; Mexico 2002-2005
(Percentage of households)

	2005				
2002	**Poor (<4)**	**Vulnerable (4-10)**	**Middle class (10-50)**	**Upper class (>50)**	**Total**
Poor (<4)	52.6	36.9	10.0	0.6	**100**
Vulnerable (4-10)	23.2	50.0	25.6	1.3	**100**
Middle class (10-50)	15.9	5.5	72.8	5.9	**100**
Upper class (>50)	12.9	0.0	12.9	74.2	**100**
Total	**31.7**	**34.2**	**31.2**	**2.9**	**100**

Source: Author's calculations based on data from MxFLS panel database.

Such vulnerability levels could potentially turn into poverty as a result of shocks.[6] As Table 1 above shows, about 23 percent of the vulnerable households in 2002 turned into poverty in 2005. A probit model analysis suggests that not having insurance and the occurrence of shocks increases in 11% and 10%, respectively, the probability of transiting from vulnerability to poverty between 2002 and 2005 —both significant at the 90% confidence level.[7] Successive minor shocks, on one hand, can run down the coping capacity of many non-poor households to the extent of being pushed into poverty. On the other hand, highly catastrophic shocks like the Tequila crisis in 1994-95 or the flu outbreak (H1N1) in 2009 and the latest 3F crises—financial, , food and fuel crisis—reasserted concerns about the need to assist households that, as a result of the crises, may have transited to a worse situation. For instance, the recent global crisis of 2008-09 caused the Mexican economy to fall

[6] The research agenda on vulnerability has been extended, but still faces practical and conceptual constraints. Most studies have concentrated on the effects of macroeconomic crises, taking advantage of panel datasets on employment (Cunningham and Maloney, 2000), as well as national level cross-sectional income and expenditure surveys (Mckenzie, 2003; Rubio and Soloaga, 2004; Narayan and Sánchez-Páramo, 2012). By contrast, and only recently, a few micro-level studies of rural areas had explored vulnerability, either quantitatively (Skoufias, 2006, 2007) or qualitatively (Latapí and González de la Rocha, 2002, 2004), but even these micro-studies have been unable to establish a clear connection between risk, poverty and social policies. Hence, despite reported progress in the study of vulnerability, important gaps remain to be filled.

[7] Other significant explanatory variables are related to the occupational status of the household head (e.g., being an unskilled worker or a self-employed involved in sales increase the probability of transiting from vulnerability to poverty in almost 20% vis-á-vis being a farmer). The geographical location, as well as positive changes in the household size, is also related to significant increases in the probability of falling into poverty. For instance, living in rural areas increases the probability in 13% compared to living in urban areas.

by 6.3%; while poverty practically remained unchanged between 2008 and 2010.[8] The size of the vulnerable population increased to an extent that practically corresponds to the decline of the middle class in those years.

Besides economic and financial crisis, Mexico is also exposed to other types of risk. In terms of crime and violence, according to recent analysis by Enamorado, López-Calva and Rodríguez-Castelán (2014), municipalities with higher levels of drug-related crimes have grown at a slower pace between 2005 and 2010 than municipalities less affected by this shock. For firms, surveys estimate that losses due to theft and vandalism account for roughly 4% of their product, and that 43% of Mexico's firms paid for private security, spending about 2.2 percent of their annual sales on these services (IFC and WB, 2012). Climate change and the proneness to natural disasters also pose challenges for Mexico,[9] especially to poor rural households who are at higher risk of suffering from disasters.[10] There is also good evidence for Mexico that natural disasters drive people into poverty.[11] To quote some study findings, severe rainfall and droughts triggered poverty persistence among poor households.[12] Children exposed to extreme precipitation shocks during their early stages of development (first years of life and in-utero stage) with respect to children not affected exhibit negative effects in the cognitive indicators, which mean that the effects persist in the medium-term.[13] And children living in rural households affected by warmer-than-average agricultural years in rural areas of Northern Mexico were shorter,[14] and from another study children in Central Mexico affected by natural disasters were also more likely to get sick than children living in unaffected areas.[15] Mexico (as other LAC countries) has also experienced increased volatility of food prices in recent years.[16] Between 2005 and 2008, world food prices rose considerably. According to the World Bank's Commodity Price Data,[17] the international price of maize increased by almost 250% and the price of rice by roughly 700%. In Mexico, the average price of the basket of imported agricultural products increased by 62% between the same years (Chávez et al., 2008). The same authors estimate that a 15% increase in food prices would imply, ceteris paribus, that approximately 2% of the population would fall into extreme poverty.

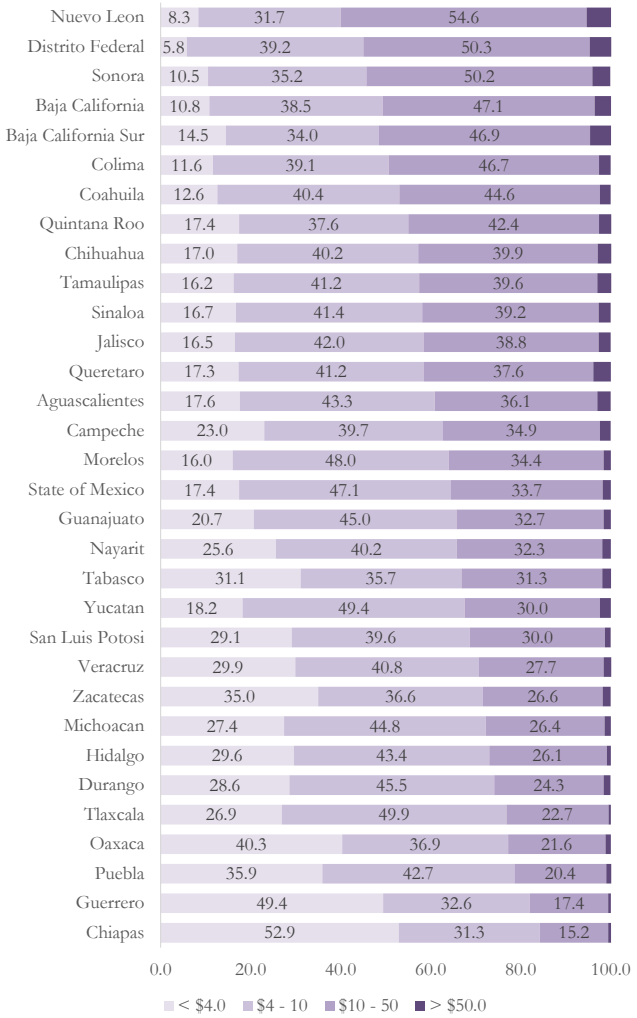
[8] The incidence of poverty slightly increased using the official poverty lines.
[9] The country lies within one of the world's most active seismic regions; is prone to constant droughts in its northern cone and is in the path of hurricanes and tropical storms originating in the Caribbean Sea, Atlantic and Pacific Oceans.
[10] Cruz, de la Fuente and Soriano (2013); Arnold et al (2012).
[11] Rodriguez-Oreggia et al (2012)
[12] De la Fuente and Borja-Vega (2014)
[13] Aguilar and Vicarelli (2012)
[14] Skoufias and Vinha (2011)
[15] De la Fuente and Fuentes (2010)
[16] Ivanic and Martin (2008)
[17] http://databank.worldbank.org/data/databases/commodity-price-data

3.1. Who are the vulnerable to poverty in Mexico?

In part because of modest economic growth and the expansion of more progressive social spending, Mexico faced a reconfiguration of its social groups (mainly) over the last decade. As shown in Figure 2, the reduction of poverty meant that between 2000 and 2012 the Mexican middle class rose by almost 12 percentage points (from 26 to 38 percent). At the same time though, there has been an expansion of the population in vulnerability in 5.4 percentage points. In fact, in 2012 roughly two-thirds of the population in Mexico remained in a situation of economic insecurity: 22.2 percent in poverty, and 43 percent in vulnerability—this is the situation of nearly half of the Mexican states where the sum of poverty and vulnerability ranges from 64.5 percent in the State of Mexico to 84.2 percent in Chiapas (Figure 3).

Figure 3: Distribution of socioeconomic groups by states

Percentage of population; Mexico, 2012



Source: Author's estimations based on MPS-ENIGH 2012

As happens with the analysis of poverty through conventional income/consumption indicators, it would be hard to disentangle the effects that make up vulnerability (or derive any policy implication) from its identification and measurement. A first effort to move beyond the concept and into the features that may heighten or suppress the threat of future consumption poverty would be to find the correlates of vulnerability levels. Some studies have found extremely similar patterns between the correlates of poverty and vulnerability (Chaudhuri et al, 2002; Ligon and Schechter, 2003; Kühl, 2005; de la Fuente, 2009). Chaudhuri (2003) argues that they are two sides of the same problem: the observed poverty status of a household is nothing less than the ex-post realization of a state, the ex-ante probability of which can be the household's level of vulnerability. Hence it is not surprising to discover the existence of broad similarities between poverty and vulnerability correlates. For instance, de la Fuente (2009) found as determinants of increased poverty and vulnerability in rural areas low-earning jobs carried out by the headship, large families and high dependency ratios, and badly-equipped households in their human and physical stock.

Yet we are considering the implications of risk for poverty, and not only its more permanent determinants. Hence there is room for expecting some differences between vulnerability and poverty in terms of the findings observed. The figures shown in Tables 2 and 3 allow us to delineate some specific profiles of these groups. The vulnerable population resides mainly in urban areas (77.6 percent); is engaged in salaried activities (73 percent); in micro-enterprises (74 percent); in the service sector of hotels and restaurants (20 percent) and, to a lesser extent, in retail (19 percent) manufacturing (17 percent), and agriculture (14 percent). This population shares some characteristics with the population in poverty (e.g. household size and incidence of disabilities), although significantly differs in others like income, education, and social security. More importantly, the vulnerable statistically differs from the middle class in almost all indicators considered. With respect to the middle class, for example, the vulnerable have a lower income (almost 3 times), and a bigger household size (by 1 member), on average.

Table 2. Characteristics of the poor, vulnerable, middle class, and upper class in Mexico, 2012

	< $4 (poor)	$4 – 10 (vulnerable)	$10 – 50 (middle)	> $50 (upper)	Total
Monthly per capita income, at PPP	$ 73.5	$ 203.5	$ 570.1	$ 2,681.5	$ 356.9
Geography					
Urban	51.5%	77.6%	91.3%	94.9%	76.8%
Rural	48.5%	22.4%	8.7%	5.1%	23.2%
	100%	*100%*	*100%*	*100%*	*100%*
Demographics					
Age of the household head	49.1	48.3	48.7	48.7	48.7
Household size	5.2	5.0	4.1	3.2	4.7
Incidence of physical or mental disabilities	7.3%	6.0%	5.1%	2.9%	5.9%
Indigenous	15.1%	4.5%	2.1%	0.8%	5.9%
Age groups					
0 - 5 years	13.7%	11.4%	7.7%	5.0%	10.5%
6 - 11 years	15.8%	12.4%	8.0%	4.8%	11.5%
12 - 14 years	7.1%	6.3%	4.5%	2.3%	5.8%
15 - 17 years	5.8%	6.4%	5.1%	3.5%	5.8%
18 - 25 years	11.2%	14.4%	16.2%	12.9%	14.3%
25 years or more	46.4%	49.0%	58.5%	71.4%	52.2%
	100%	*100%*	*100%*	*100%*	*100%*
65 years or more	8.1%	7.1%	7.2%	8.1%	7.4%
Education of the household head					
Incomplete primary or less	50.0%	35.1%	20.7%	9.6%	32.8%
Complete primary or incomplete secondary	23.2%	22.6%	16.0%	7.0%	20.1%
Complete secondary or more	26.8%	42.3%	63.3%	83.4%	47.1%
	100%	*100%*	*100%*	*100%*	*100%*
School assistance by age groups					
6 - 11 years	97.7%	99.1%	99.7%	99.4%	98.8%
12 - 14 years	89.1%	94.0%	96.3%	97.4%	93.3%
15 - 17 years	61.9%	70.0%	78.8%	89.6%	71.1%
18 - 23 years	23.0%	30.0%	44.0%	64.7%	34.8%
6 - 23 years	73.1%	71.6%	72.6%	81.1%	72.4%
Quality of dwelling and access to basic services					
Dirth floor	9.0%	3.1%	0.8%	0.2%	3.6%
Fragile walls	3.4%	1.6%	0.6%	0.4%	1.6%
Fragile ceilings	4.1%	2.1%	0.6%	0.0%	2.0%
Overcrowded	19.7%	10.6%	2.6%	0.2%	9.7%
No running water	18.8%	8.2%	3.4%	1.2%	8.8%
No sewage	22.3%	8.2%	2.1%	0.3%	9.1%
No electrical energy	1.7%	0.6%	0.1%	0.0%	0.7%

Table 2. Characteristics of the poor, vulnerable, middle class, and upper class in Mexico, 2012 (cont'd)

	< $4 (poor)	$4 – 10 (vulnerable)	$10 – 50 (middle)	> $50 (upper)	Total
Household assets and ownership					
Landline phone	17.6%	33.6%	59.7%	80.9%	40.0%
Cell phone	48.3%	70.4%	83.6%	94.1%	70.5%
TV	85.9%	95.7%	98.1%	99.0%	94.4%
Satellital TV	13.8%	25.3%	49.8%	81.7%	32.4%
Computer	7.4%	21.0%	53.2%	83.7%	30.4%
Internet	5.6%	15.6%	44.7%	78.4%	24.8%
Car or truck	22.9%	35.8%	61.0%	89.7%	42.8%
Refrigerator	65.3%	84.6%	94.8%	98.0%	84.1%
Washing machine	41.7%	63.7%	82.5%	92.0%	65.8%
Air conditioning and/or heating	4.0%	8.1%	20.8%	44.0%	12.3%
Own dwelling	72.4%	69.6%	71.5%	72.1%	71.0%
Occupational status					
Salaried	44.9%	72.7%	81.4%	80.4%	71.7%
Unpaid	15.6%	5.8%	2.7%	1.9%	6.1%
Self-employed	23.8%	13.6%	8.9%	5.2%	13.2%
Employer	15.7%	7.8%	7.0%	12.5%	9.0%
	100%	*100%*	*100%*	*100%*	*100%*
Hours worked, weekly	38.6	44.3	46.0	46.5	44.1
Salaried worker with contract	86.6%	68.2%	41.8%	20.0%	56.1%
Salaried worker without benefits	82.3%	56.0%	30.4%	16.4%	45.4%
Size of enterprise					
Micro: 1 - 10 employees	90.5%	73.9%	55.9%	38.0%	68.3%
Small: 11 - 50 employees	6.7%	15.6%	24.3%	29.1%	18.1%
Medium: 51 - 250 employees	1.9%	6.8%	11.8%	17.5%	8.3%
Big: more than 251 employees	0.9%	3.7%	8.0%	15.4%	5.4%
	100%	*100%*	*100%*	*100%*	*100%*
Sector					
Agriculture	44.1%	13.8%	3.8%	2.7%	14.6%
Mining, energy, and water	0.3%	0.6%	1.3%	2.4%	0.9%
Construction	7.7%	10.0%	6.7%	5.3%	8.1%
Manufacturing	11.3%	17.2%	15.2%	12.7%	15.2%
Wholesale trade	0.8%	1.9%	2.5%	3.9%	2.0%
Retail trade	14.4%	19.1%	17.7%	8.6%	17.4%
Transport and communications	2.8%	4.8%	5.6%	5.0%	4.8%
Financial, professional and other services	2.3%	5.4%	9.0%	14.6%	6.6%
Education and recreation	1.3%	3.2%	10.0%	14.5%	6.0%
Health	0.4%	1.4%	4.8%	10.6%	2.9%
Hotels and restaurants	13.6%	19.8%	16.3%	8.3%	16.9%
Public sector	1.0%	2.9%	7.1%	11.3%	4.5%
	100%	*100%*	*100%*	*100%*	*100%*

Table 2. Characteristics of the poor, vulnerable, middle class, and upper class in Mexico, 2012 (cont'd)

	< $4 (poor)	$4 – 10 (vulnerable)	$10 – 50 (middle)	> $50 (upper)	Total
Food security					
Food security	34.0%	49.9%	75.4%	95.0%	56.1%
Low food insecurity	26.5%	23.4%	14.5%	3.5%	20.6%
Moderate food insecurity	21.3%	16.1%	6.5%	0.9%	13.7%
Severe food insecurity	18.3%	10.5%	3.6%	0.5%	9.7%
	100%	*100%*	*100%*	*100%*	*100%*
Shock incidence during 2002-2005 (by social groups as of 2005)*					
Any shock	30.3%	27.2%	23.7%	16.7%	27.0%
Death	9.4%	7.9%	6.9%	5.3%	8.1%
Health shock	12.7%	12.1%	12.2%	10.6%	12.3%
Business bankruptcy or unemployment	7.6%	9.2%	7.8%	5.3%	8.3%
Natural disaster resulting in:					
Loss of dwelling	1.5%	0.6%	0.7%	0.0%	0.9%
Loss of crops	5.8%	2.1%	1.5%	0.0%	3.1%
Loss of livestock	2.5%	1.2%	1.6%	0.8%	1.7%
Loss of dwelling, crops and livestock	8.2%	3.4%	3.2%	0.7%	4.8%

Source: Author's estimations based on ENIGH 2012. * Author's calculations based on data from MxFLS panel database.

The MxFLS data set shows the incidence of self-reported shocks experienced by households between 2002 and 2005, and that may contribute to poverty transitions. As expected, health shocks top the list of livelihood impacts in these surveys, bearing a strong resemblance to other similar studies for Mexico. We cannot rule out the possibility that worse-off households report more impacts as these groups have less means to fight any source of distress by definition, but the occurrence of deaths, health shocks requiring hospitalization, weather shocks and, in general, any kind of shock, are somewhat stable through the different social groups suggesting that the entire population is prone to negative shocks. While not reported here, such stability in the occurrence of shocks remains for households experiencing different patterns of poverty transitions or economic mobility. Yet, those closer to poverty face a higher risk of falling back into poverty (or at least, of experiencing some degree of impoverishment) as a result of shocks. During the reported period half of the vulnerable households were food insecure and a little more than a quarter reported a shock. Another interesting result from Table 2 is that bankruptcy or unemployment was higher than any other economic group among the vulnerable.

In sum, according to the profiling of the economic group comprised by households prone to fall into poverty described in this section, the vulnerable are more likely to reside in urban areas and be engaged in wage activities, most likely in the informal sector (and to a lesser extent in the primary sector), with almost half of them under food insecurity and perhaps more likely vulnerable to economic contractions.

4. Risk, vulnerability to poverty and social policy

4.1. Risk insurance and vulnerability to poverty

A large and growing literature shows that in some contexts uninsured risk increases or leads to poverty, through ex-ante behavioral responses, affecting activities, assets and technology choices, as well as through possibly permanent effects from transitory shocks via asset loss, malnutrition, child labor, and withdrawal from schooling.

Based on the MxFLS, one can explore the magnitude of the relative contribution of (at least) the lack of health insurance and the occurrence of the abovementioned shocks to the probability of falling into poverty. Figure 4a shows the changes in probabilities of falling into poverty between 2002 and 2005—calculated from a probit model[18]— which results from changing the insurance status and the occurrence of the shocks shown at the bottom of Table 2 *vis-à-vis* a baseline that characterizes the i^{th} household as follows: "it is located in an urban area in central Mexico; no household member has faced shocks; the household head is male, he has secondary education, he is married, he is a skilled manual worker in the formal sector, and he has health insurance". The purple bar shows the estimated probability of falling into poverty for the baseline, while gray (having health insurance) and blue (no health insurance) bars show the estimated probabilities when changing the occurrence of shocks, each at a time, holding the rest constant.

The bottom line is that having health insurance reduces dramatically the probability of falling into poverty due to shocks. For instance, if the baseline household faces the death, illness or bankruptcy or unemployment of an economically active household member, its probability of being poor would rise in 4 percentage points (from 8.4 to 12.5 percent). However, if the baseline household faces the same shocks, with the difference of not having access to health insurance, then its probability of being poor would increase 13 percentage points (from 8.4 to 21.4 percent). These results are consistent, though in greater magnitude, for a rural baseline household characterized as follows: "it is located in a rural area in central Mexico; no household member has faced shocks; the household head is male, he has secondary education, he is married, he is a farmer, and he has health insurance" (Figure 4b). Overall, the magnitude of the effect of being covered by insurance schemes is thus relatively large. It is important to note, however, that the longitudinal data used here only covers the 2002-2005 period, while the *Seguro Popular* program (designed to protect those without social security against financial risks linked to ill health), although it started in 2003, expanded significantly its coverage since 2010 reaching a large percentage of the uninsured (both poor and vulnerable

[18] The model uses the transition to poverty between 2002 and 2005 as the dependent variable —based on the transition matrices estimated by Lopez-Calva and Ortiz-Juarez (2014)—, and indicators on demography, education, geographic location, labor market resources, self-reported shocks affecting the household, and dwelling characteristics as explanatory variables.

populations). Therefore, currently we would expect some positive impact of this scheme in reducing the probabilities of impoverishment.[19]

Figure 4a. Probabilities of falling into poverty between 2002 and 2005; urban baseline

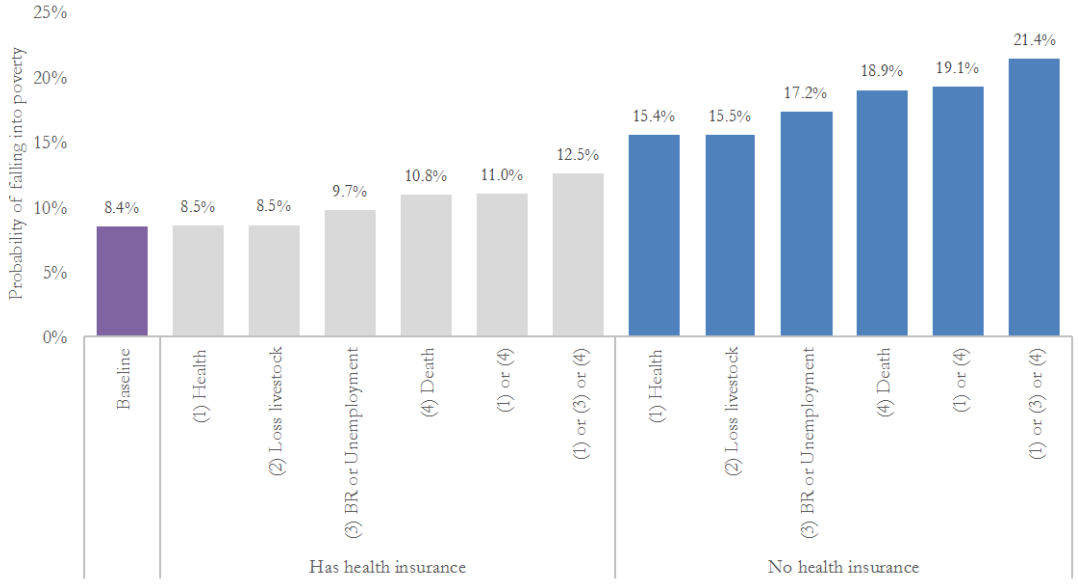
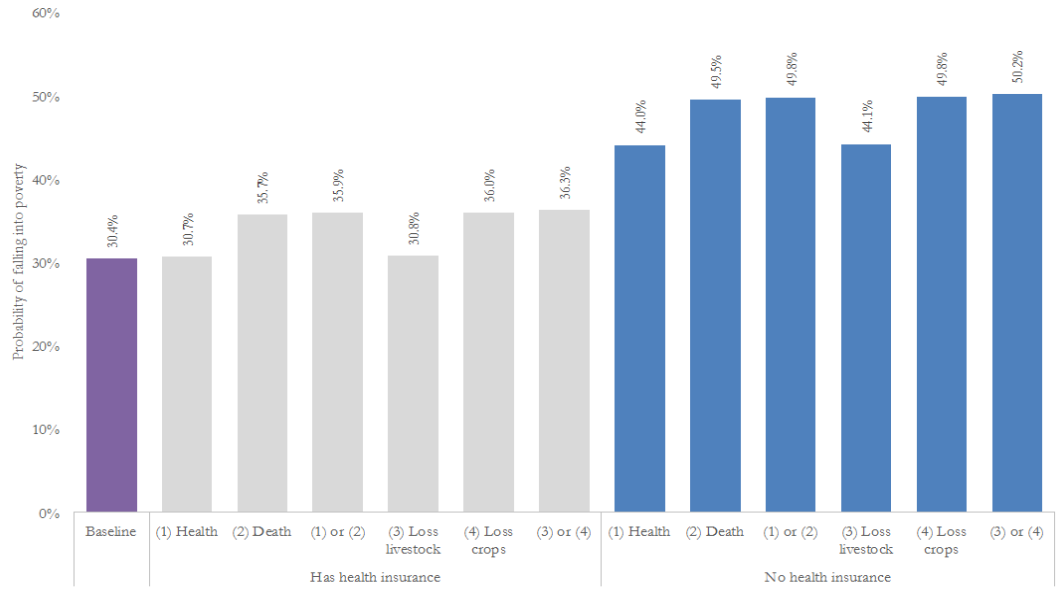


Figure 4b. Probabilities of falling into poverty between 2002 and 2005; rural baseline



Source: Author's calculations based on data from MxFLS panel database.

[19] The reform program of the current government envisages a reform of the social insurance that has been put forward for unemployment insurance. While the welfare effects of this reform depend on its design and targets, it could potentially add positive effects in curbing impoverishment risks.

Past experience suggests that raising labor market incomes could also be a policy focus against vulnerability, so as public transfers that have also played a significant role in achieving improved social outcomes and enhancing household resilience to shocks.[20] In rural areas, de la Fuente (2009) showed that conditional cash-transfer programs like *Progresa/Oportunidades* hold some potential to reduce vulnerability to poverty, especially to cope with temporary misfortunes.[21] *Progresa/Oportunidades* was, above all, a human-capital-conditional cash-transfer program, and the sheer number of evaluations has confirmed its relative accomplishment in this respect. However, it also had relative additional success as an income-supplementing program. According to some studies, the program's transfers reduced households' vulnerability while they remain in the program through asset acquisition and more stable income flows that allowed them to better plan their expenses, pay their debts and get credit more easily, impacting on consumption of goods and services (Latapí, 2005).

This is why effective social-security and social assistance programs in combination with insurance and appropriate risk management instruments are needed to prevent vulnerable households from falling into poverty. Cash transfers, conditional and unconditional, workfare programs, food/nutrition aid, health, weather and unemployment insurance, and labor market policies could support the poorer and vulnerable by strengthening their assets and livelihoods, as well as improving their capacity to manage risk. Some of these social policy instruments already exist in Mexico. Yet, social protection is typically targeted towards the poorer, so the question remains as to what extent social policy reaches the vulnerable.

With the identification of vulnerable households at a national scale based on the methodology employed in this paper it is possible to explore the incidence of various social protection programs on the vulnerable and other groups in Mexico.

4.2. Public transfers and vulnerability to poverty

This section presents incidence results of some of the principal safety nets instruments in the form of direct transfers in Mexico over the first decade of the 2000s. The programs analyzed include basic social programs and direct monetary transfers,[22] and their information was retrieved from questions contained on a module of social programs within the ENIGH which asked whether households

[20] Azevedo et al. (2012) show that changes in labor income per hour and public transfers accounted, on average, by 45 and 14 percent, respectively, of the decline in inequality in Latin America during the last decade.

[21] The conditional cash-transfer program known as *Progresa/Oportunidades* has been recently redesigned as a program of social inclusion now called PROSPERA. This new program aims at linking beneficiaries of the traditional cash transfers in exchange of improving human capital to a number of other interventions; for instance, financial literacy, inclusion in the labor market and productive activities for beneficiaries.

[22] Following Scott (2013), for the purposes of this paper public transfers are defined to include public spending on education, health, direct cash transfers, and smaller in-kind transfers (food programs and day care centers). These programs represented 8.7 percent of GDP in 2010. Mexico's official functional classification of social spending includes, in addition to the above, spending on contributory pensions, housing, and water and sewage. At this stage, in-kind transfers and all of the latter are not analyzed here for lack of the required information.

received benefits from particular programs. The module of social programs at the ENIGH was commissioned by SEDESOL and therefore has no coverage on programs outside the Ministry. We also incorporate some considerations on risk insurance programs that could prevent the vulnerable from falling into poverty.

In addition to the intrinsic difficulties for categorizing economic groups, there is very limited evidence on how well targeting is working in Mexico across groups because almost none of the programs collect rigorous data on beneficiaries' income. A couple of words of caution need to be stressed before moving into the analysis: (i) some of the programs reviewed do not exist any longer, or have been configured differently; and (ii) there is always a risk of underrepresenting the coverage of social programs as the sample sizes are small and not designed to sample correctly the programs under review; in other words, most programs cover such a small proportion of the population that they may not show up significantly in the ENIGH. Nonetheless, these potential inaccuracies do not invalidate our general conclusions.

The *Oportunidades* program, Mexico's largest anti-poverty program, introduced in 1997 (as *Progresa*, and recently called *Prospera*), was a conditional cash transfer scheme covering 5.8 million poor households in early 2014 with a budget of 38 billion pesos, or US$2.8 billion, equivalent to 0.23% of GDP.[23] Among other benefits, *Oportunidades* delivered in 2014 5.9 million scholarships (4.9 million for basic education and 1 million for high school) with an average monthly transfer ranging between $165 and $1,055 pesos (US$12-78), and covered 5.9 million families with health care, including prenatal care, 1.6 million children with nutritional care, and 1.4 million children (6-59 months) with food supplements. The *Programa de Apoyo Alimentario* (PAL) was introduced in 2006 to reach the extreme poor in remote localities not reached by the conditional cash transfer program *Oportunidades*. In 2011 PAL covered 674,000 families with an average monthly transfer per beneficiary family of 524 pesos, or US$39). The *Programa de Apoyos Directos al Campo* (PROCAMPO) comprises a yearly cash transfer of 1,300 pesos (US$96) per hectare to small-farmers (under five hectares) and 963 pesos (US$71) to the rest; it was introduced in 1994 to compensate agricultural workers for the opening up of agricultural markets under the North American Free Trade Agreement (NAFTA). In 2011, it covered 2.65 million agricultural producers with an average monthly transfer per beneficiary producer of 437 pesos, or US$32. The *70 y más* program was a federal non-contributive pension scheme offering 500 pesos monthly (US$37) to all the non-insured aged seventy or more in localities with fewer than 30,000 inhabitants. With 2.15 million beneficiaries in 2011, it was expanded to all localities in 2012 with a substantial budgetary expansion.[24] Finally, the *Programa de Empleo Temporal* (PET), is a basic workfare program created in 1995 providing a maximum of 88 days of work for low wage (originally 90 percent of the minimum wage, at present 99 percent). In 2009 and 2010 it

[23] The market exchange rate used in all figures of the described programs was $13.5 pesos per dollar.

[24] During 2012, the coverage of *70 y más*, a federal non-contributory pension program, was extended to all adults aged 70 years or older who were not receiving any other pension. Previously it was restricted only to those living in localities with fewer than 30,000 inhabitants. In February 2013, eligibility to the program was extended to all adults aged 65 and over and the program changed its name to *65 y más*. This paper will focus its analysis on the *70 y más* program, since its redesign occurred just after the last available household survey, the ENIGH 2012.

was expanded as a response to the 2009 crisis (after having been reduced significantly over 2000-2006). In 2011 it covered 1.1 million beneficiaries with a total budget of 2.9 billion pesos (average monthly transfer per beneficiary in 2011 of 224 pesos, or US$17). The analysis also covers three broader transfer categories reported in the ENIGH survey without identifying specific programs: a) other non-contributory pensions, b) other public scholarships, and c) other public transfers. It also includes two additional programs with a very low incidence of beneficiaries, as shown below: (1) the *Opciones Productivas* program, aimed at supporting productive projects among rural population in poverty through the development of technical and productive skills; and (2) the *Crédito a la Palabra* scheme, aimed at providing economic resources to farmers in order to diversify economic activities in areas of low productivity and/or with high occurrence of natural shocks.

Using the data set generated by Lopez-Calva and Ortiz-Juarez (2014), we divide the vulnerable population between those extremely vulnerable if they face a probability of falling into poverty of 30% or more, and those moderate vulnerable if their probabilities are between 10% and 29%. In monetary terms, the former group lives on $4-5.50 a day, while the latter on $5.50-10 a day. The incidence and benefits of programs is then analyzed for these groups. As a comparison, we also include results for the population in poverty, according to the $4 a day poverty line, the middle class ($10-50), and the residual or upper class (more than $50).

The poverty line of $4 a day is equivalent in 2012 to the urban/rural weighted national income poverty level defined officially as food-based poverty ($3.99 a day) by the National Council for Evaluation of Social Development Policy in Mexico (CONEVAL), and it is close to the capabilities-based poverty ($4.8 a day). A household is considered food poor if its member's income falls below the lowest income necessary to afford a minimum basket of food. On the other hand, it is considered to be in capabilities-based poverty if its members cannot afford their basic expenses on food, health and education. The objective population for the *Oportunidades* and PAL programs, for instance, is comprised by individuals in food-based poverty, so that the use of the international standard of $4 a day is a good proxy for the analysis of both programs' coverage. There is a third, higher official standard that identifies as asset-based poor those individuals who cannot cover their expenses of food, health, education, dressing, home and public transportation. Its value is equivalent to US$7.8 a day, falling into the vulnerable segment.

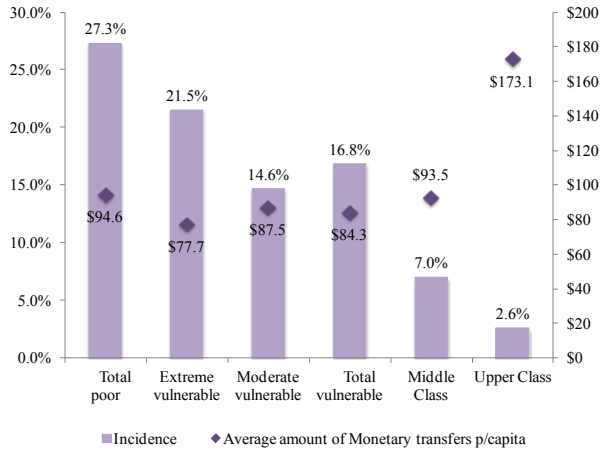
Social Programs Largely Cover the Poor but Barely Reach the Vulnerable

The 2010 Module on Social Programs identifies at least 15 types of cash transfers (by destination of resources) that can be grouped into scholarships, purchase of food, non-contributory pensions, and training and incentives transfers aimed at starting up productive projects. Figure 5 shows the incidence and average monthly amount of such transfers across socioeconomic groups: While coverage among the poor population is the highest, only about 17 percent of the vulnerable population receives such transfers (almost 22 percent of those in extreme vulnerability, and almost 15 percent of those in moderate vulnerability). Yet, the vulnerable group has the second highest incidence of cash transfers of all sorts (Figure 6). For those groups in the middle and upper classes,

the incidence is relatively low, but the amounts received are significantly higher than those of the vulnerable population. It is noteworthy that among the upper class only 2.6 percent receive cash transfers, but they receive a monthly average of $173.

Figure 5. Incidence and average amount of monetary transfers by social class

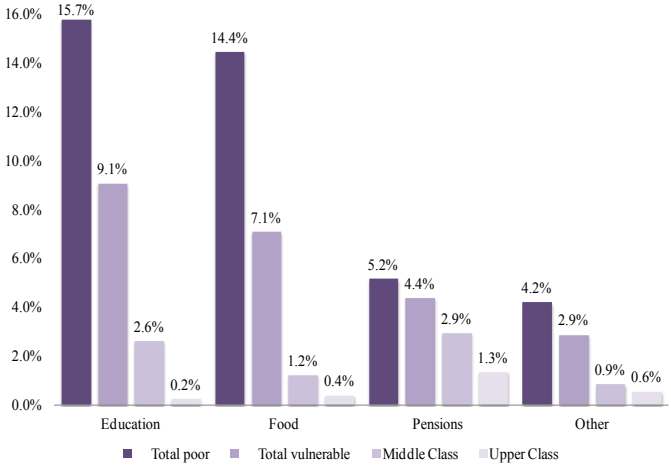
Percentage of households and monthly dollars, at PPP



Source: Author's estimations based on ENIGH and MPS 2010

Figure 6. Incidence of monetary transfers by destination and socioeconomic class

Percentage of households



Source: Author's estimations based on ENIGH and MPS 2010

Among the vulnerable population (both moderate and extreme), Figure 7 shows that direct transfers from *Oportunidades* aimed at incentivizing the enrolment and assistance to all levels of education (i.e., scholarships comprised under the heading of Education) are the most important transfer in terms of coverage, and increased notably during the 2000s (Figure 8). Such conditional scholarships are highly

relevant for human capital accumulation with potential benefits in helping to prevent falls into poverty in the long-run.

Figure 7. Incidence and average amount of monetary transfers among vulnerable, by destination of resources

Percentage of households and monthly dollars, at PPP

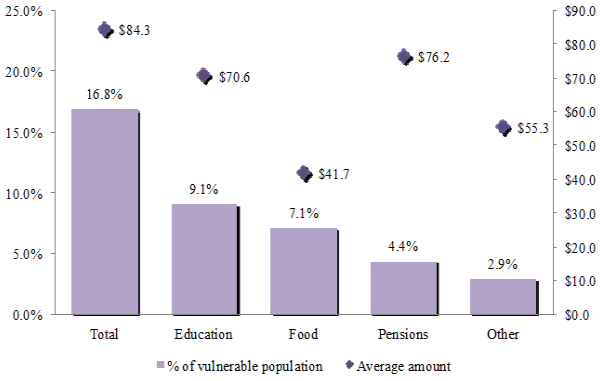
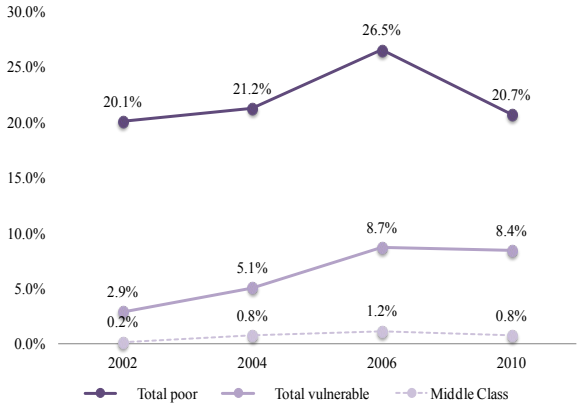


Figure 8. Incidence of *Oportunidades* scholarships by groups

Percentage of households

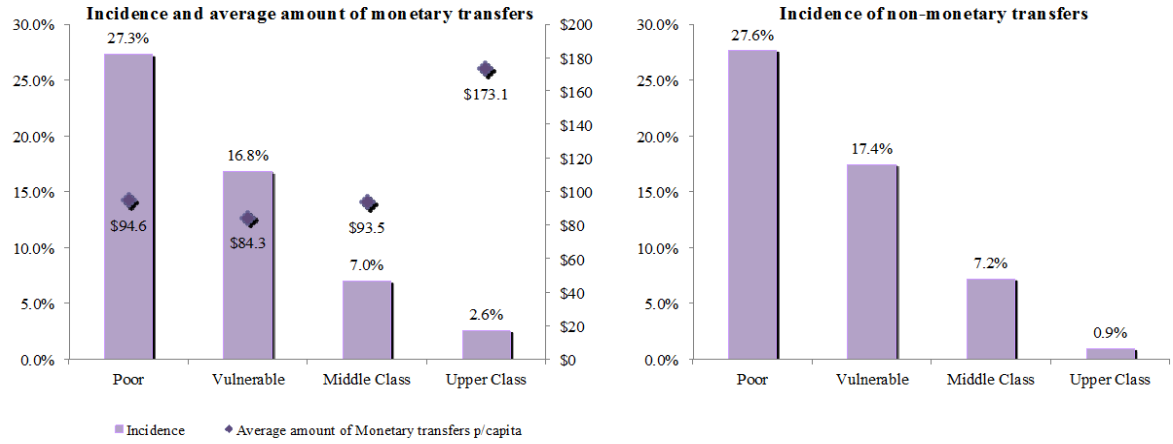


Source: Author's estimations based on ENIGH and MPS 2010

As in the case of cash transfers, just over 17 percent of the vulnerable population receives in-kind transfers, especially those aimed at improving nutrition and the acquisition of school supplies among those in extreme vulnerability (Figure 9).

Figure 9. Incidence and average amount of monetary and non-monetary transfers by social class

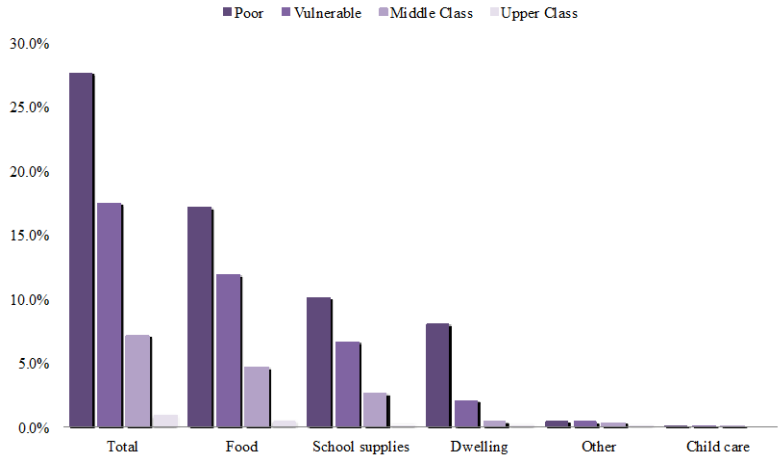
Percentage of households and monthly dollars, at PPP



Source: Author's estimations based on ENIGH and MPS 2010

Figure 10. Incidence of non-monetary transfers by destination and socioeconomic class

Percentage of households



Source: Author's estimations based on ENIGH and MPS 2010

Finally, in terms of incidence of programs, the vulnerable population is mainly involved in *Oportunidades* (18%), access to DICONSA stores (7.4%) and Liconsa (8.5%)—where the participation of the vulnerable population is even higher than the population in poverty (6.2%) (Figure 11).

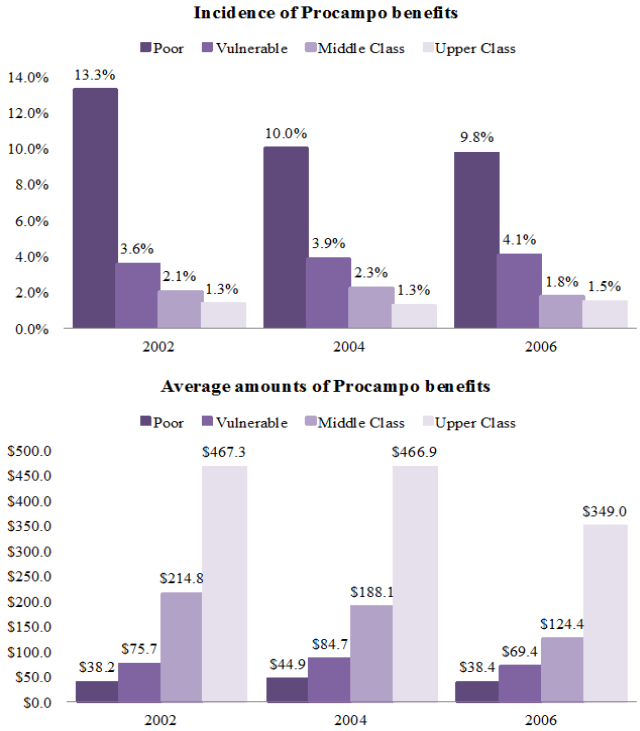
Figure 11. Incidence by program and socioeconomic groups

Source: Author's estimations based on ENIGH and MPS 2010

In addition to these transfers, the MPS data sets reveal the incidence of *Procampo,* a program supporting the agricultural sector through cash transfers. During 2002-2006, the groups in poverty and vulnerability had the highest incidence for this program, but significantly higher monthly amounts are allocated for people in the middle and upper classes. In general, several studies have documented the regressivity of this program (Scott, 2013) (Figure 12).

Figure 12. Incidence and amount of transfers of Procampo

Percentage of households by class, and monthly dollars at PPP



Source: Author's estimations based on ENIGH and MPS 2002-2006

The fact that most social programs have a low incidence among the vulnerable is not necessarily worrisome. Most of these programs were conceived to target the poor. It is beyond the scope of this paper to establish whether social programs in Mexico should remain faithful to their original mandate or if they should further their target population to encompass the vulnerable. Both groups are not very different in many respects, including their human stock as well as their levels of food insecurity, not to mention their exposure to risk. Yet, one could also argue that many households under poverty remain to be covered before expanding social programs to the vulnerable population.

Productive programs have also a low incidence among the vulnerable

Vulnerability in Mexico stems from a combination of highly unsettled and probably low-paid employment and low economic security (Table 2), which remains a protracted source of stress, and exposure to many different risks (Figure 4), which are somewhat unpredictable. Indeed, Table 2 suggests that the vulnerable have higher levels of human capital than the poor and are salaried employees in much higher proportions (almost three-quarters). Yet, their income levels place them at the edge of poverty and for many their employment conditions seem pretty unsettling: One-third of salaried workers have no contract and for more than half employment comes with no benefits. Hence raising labor market incomes could be a policy focus against vulnerability, possibly through more vocational and job skills training to improve the capacities of those already employed. In addition, as the second group with self-employed in their ranks, another option for the vulnerable is

to have increased access to credit and incentive transfers to start up productive projects. In this regard, during the recent years some studies have questioned whether social programs in Mexico like *Oportunidades* (one of whose aims is to increase human capital by raising school attendance) should remain faithful to their original mandate or if they should further their objectives by granting its youth "graduates" funds to continue into university-level studies or by connecting them to career-type employment opportunities (Latapí, 2005; Inter-American Development Bank, 2006). In this line, the so-called *Prospera* takes an important first step towards extending the traditional benefits of *Oportunidades* by additionally granting scholarships for tertiary or technical education enrollment, as well as to providing job training and access to productive projects for those beneficiaries in search of a job.

The Social Program Module reveals a very low incidence of productive programs from SEDESOL among the vulnerable population—because of their reduced coverage and magnitude. For instance, between 0.1% and 0.3% of the vulnerable population were beneficiaries of *PET*, *Opciones Productivas*, and *Crédito a la Palabra* during 2002-2006 (among the poor the percentage of beneficiaries of PET reached 0.8%, on average, between 2002 and 2006, but only 0.3% in the case of *Opciones Productivas* and *Crédito a la Palabra*, and among the middle class, the percentage of beneficiaries of all three programs was roughly 0%). Even for schemes like credits and government subsidies[25] whose coverage has been increasing, their incidence is very low and their impacts and scope are unknown (Table 3).

Table 3. Incidence and amounts of credits and government subsidies

Percentage of households and monthly amounts in PPP

	Coverage		Amount	
Economic Group	**Credits**	**Subsidies**	**Credits**	**Subsidies**
		2002		
Extremely poor	0.54%	0.86%	$ 6.83	$ 92.79
Poor	0.10%	0.09%	$ 79.85	$ 6.91
Total poor	0.32%	0.48%	$ 43.52	$ 49.64
Extremely vulnerable	0.16%	0.11%	$ 18.60	$ 13.49
Vulnerable	0.02%	0.07%	$ 373.87	$ 10.00
Total vulnerable	0.07%	0.09%	$ 250.59	$ 11.21
Middle Class	0.36%	0.16%	$ 799.77	$ 1,337.91
Upper Class	0.00%	0.00%	$ -	$ -
		2004		
Extremely poor	0.38%	1.46%	$ 88.44	$ 30.38
Poor	0.47%	0.46%	$ 43.07	$ 54.17
Total poor	0.43%	0.92%	$ 63.96	$ 43.22
Extremely vulnerable	0.15%	0.43%	$ 162.74	$ 27.64
Vulnerable	0.06%	0.62%	$ 324.60	$ 121.86
Total vulnerable	0.09%	0.55%	$ 269.81	$ 89.97
Middle Class	0.06%	0.37%	$ 206.83	$ 70.40
Upper Class	0.00%	0.12%	$ -	$ 112.84
		2006		
Extremely poor	0.16%	1.11%	$ 154.91	$ 18.41
Poor	0.09%	0.79%	$ 92.73	$ 49.34
Total poor	0.12%	0.92%	$ 118.03	$ 36.75
Extremely vulnerable	0.74%	0.70%	$ 35.11	$ 25.25
Vulnerable	0.08%	0.57%	$ 440.06	$ 38.45
Total vulnerable	0.27%	0.61%	$ 319.23	$ 34.51
Middle Class	0.15%	0.49%	$ 135.87	$ 58.68
Upper Class	0.23%	0.79%	$ 1,276.61	$ 259.70

Source: Author's estimations based on ENIGH and MPS 2002-2006

[25] The use of credits and subsidies from government includes, among others, credits to expand the business or improve the dwelling; credits to purchase livestock, fertilizers, insecticides and equipment; subsidies for energy and fuel, livestock feed, and care of livestock, crops and fisheries.

Risk insurance for the vulnerable has expanded in recent years[26]

Until recently, the vulnerable population in Mexico has been only partially covered by social programs and none of these programs were oriented to protect against risks (health, weather and unemployment insurance). The exceptions are *Oportunidades* (incidentally, not by design) and the *65 y mas* program, but mainly the *Seguro Popular* scheme, developed to provide security against financial risks linked to ill health, and whose coverage has expanded significantly in recent years. This program is especially important in Mexico, where the relevance that health insurance holds for preventing poverty (See section 4.1) is compounded by the fact that both poor and vulnerable groups have very low coverage of "formal" channels[27] of social security and medical services. According to Table 4, contributory pensions cover only 13.5 percent of the poor and 34.4 percent of the vulnerable, while formal medical services (IMSS, ISSSTE, Pemex, Sedena, Semar, etc.) reach 9.3 and 31.3 percent, respectively—nonetheless, the incidence of health shocks is similar in relative terms for all the groups shown (see the bottom of Table 2). Furthermore, one-quarter of both the vulnerable and poor populations have no access to medical services at all.

Table 4. Social security and medical services among the poor, vulnerable, middle class, and upper class in Mexico, 2012

	< $4	$4 - 10	$10 - 50	> $50	Total
Pensions					
Contributory (social security)	13.5%	34.4%	58.6%	66.9%	38.8%
Non-contributory (*adultos mayores)*	43.8%	36.7%	26.2%	8.8%	34.2%
Medical services					
No access	24.7%	22.6%	18.6%	15.8%	21.5%
Seguro Popular	65.9%	46.0%	20.2%	6.5%	40.7%
IMSS	7.9%	25.5%	40.7%	36.3%	27.0%
ISSSTE or ISSSTE	0.7%	3.1%	12.3%	14.7%	6.0%
Pemex, *Sedena* and *Semar*	0.1%	0.4%	1.5%	3.8%	0.8%
Other social security services	0.4%	1.5%	2.3%	2.4%	1.5%
Private	0.1%	0.1%	1.4%	15.1%	0.9%
Other	0.3%	0.8%	2.9%	5.5%	1.5%
	100%	*100%*	*100%*	*100%*	*100%*

Source: Author's estimations based on ENIGH 2012

The above results highlight the relevance of (non-contributory) social protection strategies such as the *Adultos Mayores* program for pensions, and the universal pension introduced for elder beneficiaries of Progresa since 2006 as well as the extended health coverage granted for the uninsured through *Seguro Popular* ["Popular Insurance"]. In principle, these schemes should help to

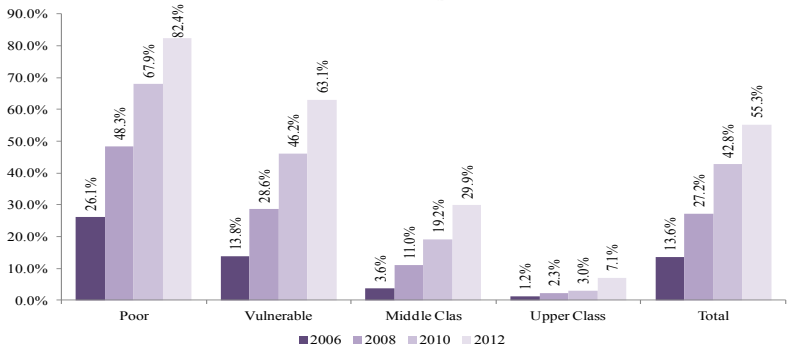
[26] The weather risk discussion in this section is based on De la Fuente and Giné (2014).

[27] It refers to the access to pensions and medical services for workers in the formal, private and public, labor market.

avoid out-of-pocket expenditures and thus impoverishment due to healthcare payments. And indeed schemes like *Seguro Popular* have improved significantly the coverage among the poor and vulnerable. As Figure 13 shows, almost two thirds of the vulnerable were covered by *Seguro Popular* in 2012. The targeting efficiency of health coverage can still be improved, for instance, the census record of the *Seguro Popular* was not paired off with *Oportunidades*, and both programs seem to have to incorporate better tracking of the health conditions of those sectors of the population more prone to experience deteriorating health (i.e. elderly, disabled, chronically ill).

Figure 13: Coverage of *Seguro Popular*, 2006-2012

Percentage of Population



Source: Author's estimations based on ENIGH 2006-2012

Business bankruptcy or unemployment within the vulnerable population fared the highest across socioeconomic groups in the MxFLS. This high exposure is compounded by the fact that vulnerable groups have little access to credit sources captured by our study survey. The unemployment insurance reform recently proposed by the government of Mexico may eventually address part of this failure, but at the moment lacks a robust analysis on its short- and medium-term effects on welfare. In general, this insurance scheme allows workers to access up to six monthly payments in the event of losing their jobs, with an amount being paid as follows: the first payment equals 60 percent of the average worker's wage during the past 24 months; the second equals 50 percent of the same average; and the last four payments are equivalent to 40 percent. This scheme seems to establish a new social right for workers; however, while three quarters of the vulnerable are engaged in wage activities, it is very likely that many reside in the informal sector (more than half of the salaried workers reported no benefits and a third reported no contract) and thus remain ineligible for unemployment insurance.

Earlier sections show that weather risks prevail in Mexico, and these can drive people into poverty. The agricultural sector is particularly susceptible to climatic conditions given that most farmers remain locked in low productivity rain fed agriculture (three-quarters of the area cultivated in Mexico is rain fed). The vulnerable are mainly located in urban areas and engaged in wage activities, but many remain involved in agriculture (which is the fourth activity for this group after services, retail trade and manufacturing) and may experience poverty if they face weather risks without having access to insurance and credit.

The *Mexican Catastrophe Climate Contingency Insurance Program* (*CADENA*) is a state level program managed by the Ministry of Agriculture (SAGARPA) that was launched in 2003 to provide state governments with co-funding for assisting farmers after a natural disaster or to provide a subsidy for the state government to purchase insurance (mainly index-based contracts) in order to have enough fiscal resources to respond ex-post. In other words, payouts go to the federal and/or the state government (the policyholders) in case of an occurrence of a covered event, which in turn provide assistance to farmers in the form of a pre-agreed lump sum amount per farm. The intended beneficiaries of the *CADENA* insurance programs are crop and livestock producers without public or private agricultural insurance and who own and/or cultivate up to 20 hectares of seasonal crops or up to 10 hectares of perennial fruit crops, for the case of crop farmers. These caps apply throughout Mexico and are reviewed on a regular basis. However, the limits for seasonal crops have never been less than 10 hectares (that was the cap between 2010 and 2012), or less than 5 hectares for perennial fruit crops. In all likelihood, these eligibility criteria comprise many vulnerable families.[28]

Survey information coming from a random sample of *CADENA* beneficiaries (specifically from a beneficiary census of 2012) affected by various disasters in 2011-12[29] show that more than three quarters declared to perceive a monthly income of less than $4000 pesos, roughly equivalent to the US$10 a day upper bound of vulnerable group according to our definition (See Table 5). The survey results also tend to confirm that the *CADENA* components are targeting and reaching the intended beneficiaries: in the case of crops, almost 100% of the surveyed beneficiaries were within the eligibility criteria (cultivating less than 20 Ha of rainfed annual crops). Of course, these surveys do not capture producers that may have been excluded due to poor targeting.

Table 5. *CADENA* Beneficiaries Average Monthly Income, 2012

	< $1000 <US$2.5	**$1001 - $2000** ~US$2.5-US$5	**$2001 - $3000** ~US$5-US$7.7	**$3001 - $4000** ~US$7.7-US$10.2	**> $4000** ~>US$10.2	**N/R**
State & Disaster Record Number						
Chiapas (300598)	7.63%	49.62%	22.14%	0.76%	0.00%	19.85%
Chihuahua (300580)	33.37%	32.13%	9.34%	6.29%	1.72%	17.16%
Guanajuato (300591)	21.16%	23.18%	25.20%	13.44%	9.85%	7.17%
Nayarit (300755)	46.94%	38.78%	3.67%	0.00%	0.00%	10.61%
Veracruz (300595)	5.50%	41.00%	19.00%	12.50%	7.00%	15.00%
Veracruz (300609)	8.82%	35.29%	14.71%	11.76%	5.88%	23.53%
Zacatecas (300745)	7.63%	36.83%	30.34%	5.53%	3.63%	16.03%
Total	**23.34%**	**32.22%**	**18.30%**	**7.96%**	**4.58%**	**13.59**

Source: de la Fuente and Giné (2015). N/R: No Response.

[28] Three quarters (76%) of farms across Mexico are subsistence or for personal consumption and have less than 5 hectares.

[29] Since 2003, SAGARPA has contracted the Autonomous University of Chapingo to conduct various independent monitoring and evaluation exercises of the effectiveness of *CADENA*, including the extent to which the targeted farmers are benefitting from the payouts provided.

Since its introduction in 2003 the *CADENA* insurance program has expanded hugely such that in 2011 over 2.5 million farmers had been insured. It is debatable however whether *CADENA* should be targeted at farmers with up to 20 hectares of irrigated annual crops given that these farmers are not among the most vulnerable sectors of the rural farming population. Moreover, survey respondents noted that the *CADENA* payouts are inadequate to cover their costs invested in agricultural production – overall 60% replied that the payouts represented less than a quarter of their investment costs at the time of loss. There is a clear tradeoff for the government between increasing or keeping the coverage for vulnerable farmers and increasing the compensation amounts.

5. Conclusions

The vulnerable are the largest economic group in Mexico. These are people who left poverty but do not have yet enough "economic security" to be considered part of the middle class. The people who belong to this economic group are more likely to reside in urban areas (though a quarter still resides in rural areas) and be engaged in wage activities (less so in the primary sector), most likely in the informal sector and exposed to a wide range of risks. Their situation probably stems from a combination of highly unsettled and low-paid employments, which remains a protracted source of stress, and exposure to many risks, which are often short-lived and somewhat unpredictable. It therefore seems necessary to distinguish between long-term and short-term sources of vulnerability to poverty.

From a policy perspective, keeping the distinction between quasi-permanent factors and risks is all the more relevant as the measures that need to exist to address each problem are very different. A 'first-best' solution would be to improve the capabilities and grant adequate entry points into labor, commodity and service (credit) markets. The provision of adequate jobs to enhance the prospects of wealth accumulation and labor mobilization is required, as are job skills and vocational training and productive investment grants. Effective risk management policies are also needed. The provision of cash transfers, conditional and unconditional, workfare programs, food/nutrition aid, health- and weather-based insurance products, and labor market programs and policies could go a long way toward mitigating the impact of risk and shocks that could turn the vulnerable into poverty.

Many of the policies and instruments referred above already exist in Mexico, and their incidence has been captured in the *Module of Social Programs* (commissioned by the Ministry of Social Development - SEDESOL) as part of the National Household Income and Expenditure Survey (ENIGH). With the identification of vulnerable households from the ENIGH at a national scale based on the methodology employed in this paper it is possible then to explore the incidence of various social programs on the vulnerable and other groups in Mexico.

Our analysis shows that social programs rarely reach the vulnerable, according to the 2010 module of social programs —since then new strategies and reforms to existing programs were introduced to reach a larger share of the non-poor population. This is not indicative of underperformance as most

of these programs were conceived to target the poor. Yet, our analysis also revealed a very low incidence amongst the vulnerable within the few social programs that have a productive orientation in Mexico like *Opciones Productivas* and *Crédito a la Palabra*. If the vulnerable have higher endowments of human capital, they should be receiving support to develop their job skills at work as a means to improve their wage prospects as well as training and working capital through credit to thrive.

Beyond the limited extent to which vulnerable households in Mexico are covered by public transfers, it is important to note that such transfers are not designed to protect the vulnerable population from potential risks. So the question remains as to what extent other social policies respond to risk-driven vulnerability. The evidence in this respect is mixed and more limited: The extended health coverage granted for the uninsured through *Seguro Popular* ["Popular Insurance"] should help to avoid out-of-pocket expenditures and thus impoverishment due to healthcare payments. This program has improved coverage significantly among the poor and vulnerable: In 2012, two-thirds of the vulnerable were covered by this scheme—the expansion of the non-contributory pension scheme has been also significant. Unemployment insurance in Mexico is still under design and political discussion. Many of the vulnerable are likely to work in the informal sector (more than half of the salaried workers reported no benefits and a third reported no contract), which is one of the main elements to be addressed in the design of a potential unemployment insurance. While the vulnerable are mainly located in urban areas and engaged in wage activities, many remain in agriculture and may experience poverty if they face weather risks without having access to insurance and credit. The main public weather insurance schemes contained in Mexican Catastrophe Climate Contingency Insurance Program (*CADENA)* are likely to comprise many vulnerable families given their eligibility criteria. The little available evidence coming from surveys of *CADENA* beneficiary censuses in 2009 and 2012 corroborate this perception, but we are still missing a comprehensive picture on the incidence of weather insurance across economic groups in Mexico. Finally, targeted cash-transfer programs like *Oportunidades* also hold some potential to ameliorate risk-driven vulnerability, but their incidence among this group is fairly limited (by design). The transition of this scheme to PROSPERA would, of course, go in the direction of making smart investment in the target poor population so that they escape poverty and improve their potential.

How to tackle the relative absence of social policies focused on the vulnerable? If programs outside the Ministry of Social Development are already servicing the vulnerable one can adopt an inertial approach (i.e. leave things as they stand), and continue assuming that social programs should only take care of the poorest segments of the population. Most of the programs analyzed here come from a module of social programs, commissioned by the Ministry of Social Development - SEDESOL, embedded into the ENIGH. We therefore could not assess the potential coverage of programs outside Social Development tapping into the vulnerable population. For instance, those focused on labor and financial markets, if they exist. However, if other programs outside the Ministry of Social Development are not servicing the vulnerable, it is clear that this sector is widely neglected in policy-making. One relevant aspect to mention is that coverage indicators used in this document were up

to 2010 and 2012; and given the effort to expand coverage in the last two years the picture might be less worrying now.

Our understanding of vulnerability in Mexico would benefit from an incidence analysis of non-social programs as well. The ENIGH is attractive for our study because it is comparable across time and has detailed information on income and household characteristics. Yet, the survey could be further improved by embedding questions on the incidence of a broader set of public programs that may affect various economic groups, including labor market policies and financial inclusion. Likewise, many risk-related aspects addressed by our study could be better understood with a comprehensive module on risks and their attributes, including their incidence (not just their impact), severity, and length, where applicable, as well as the household and public responses available and implemented to cope with them.

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