Background Paper

Living on the edge: Vulnerability to poverty and public transfers in Mexico

Alejandro de la Fuente
Eduardo Ortiz-Juárez
Carlos Rodriguez-Castelán
The World Bank

Living on the Edge:
Vulnerability to Poverty and Public Transfers in Mexico[1]

Alejandro de la Fuente
Eduardo Ortiz-Juárez
Carlos Rodríguez-Castelán[2]

1. Introduction

Individuals and societies as a whole face multiple risks, including extreme climate-related events[3], diseases and economic crises, and these can all have pernicious consequences for poor and non-poor alike. In some contexts, exposure to these risks can lead into (or exacerbate) poverty because households typically are not protected against them. Risks turned into shocks could potentially lead to asset loss, malnutrition, and child labor, when people lack safety nets and insurance. Furthermore, when households lack adequate access to financial and social insurance institutions, they could end up using their few assets, which could trap them in poverty (). It thus seems necessary to better understand the nexus between vulnerability to poverty and risk.

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.[4] This capacity will, in turn, eventually determine how liable individuals or households are to poverty. In addition to this 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 . Vulnerability could also 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 villages where those concerned reside.

The concept of vulnerability used in this paper aims to identify households at risk of welfare shortfalls in the future, based on their current standing. In this sense, it is an ex-ante, forward-

---

[2] Alejandro de la Fuente (adelafuente@worldbank.org) is Poverty Economist for the Africa Region, the World Bank; Eduardo Ortiz-Juárez (eduardo.ortiz@undp.org) is Economist at the UNDP's Regional Bureau for Latin America and the Caribbean, and Consultant at the World Bank; and Carlos Rodríguez-Castelán (crodriguezc@worldbank.org) is Economist for the Latin America & Caribbean Region, the World Bank.

[3] 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.

[4] Risk is often differentiated from shocks (risk realizations) to emphasise 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.

looking measure. A robust comprehension, and therefore, a better use of the concept of vulnerability to poverty would be helpful for several reasons. Firstly, 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 forward-looking anti-poverty interventions, including the implementation of preventive measures to avoid or reduce risks. Secondly, a clear 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).

Why study vulnerability to poverty in Mexico?

Mexico, as many other countries in Latin America and the Caribbean, has made laudable progress in the last decade in reducing poverty, inequality, and widening the middle class. Poverty, defined as life on less than US$4 per capita a day, at PPP (2005 international $)[5], has declined by 18 percentage points (from 40.1 to 22.2 percent) during 2000-12 (Figure 1). A decomposition approach based on Datt and Ravallion (1992) reveals that in the last decade almost 88 percent of the reduction in poverty was due to redistribution (Figure 2)[6]. In fact, high levels of income inequality started to recede since the late 1990s. Over the last decade, the Gini coefficient dropped from 0.537 to 0.474, equivalent to an average annual change of 1.17 percent (Lustig et al., 2013).

---

[5] Unless otherwise indicated, all income or expenditure figures are expressed in Purchasing Power Parity terms (2005 international $). The $4 a day poverty line is a conditional mean (on per capita GDP) of the national poverty lines across the Latin American region.

[6] This approach quantifies the relative contributions of economic growth and redistribution to changes in poverty. Changes in poverty are decomposed into three components: growth, redistribution, and a residual term. The growth component represents the change in poverty attributable to changes in mean income when holding the relative distribution of the reference year constant; the redistribution component represents the change in poverty attributable to changes in the distribution holding mean income constant; and the residual term represents the part that cannot be exclusively attributed to growth or redistribution.

Figure 1: Size of the socioeconomic groups in Mexico
(Percentages)

Percentage of households

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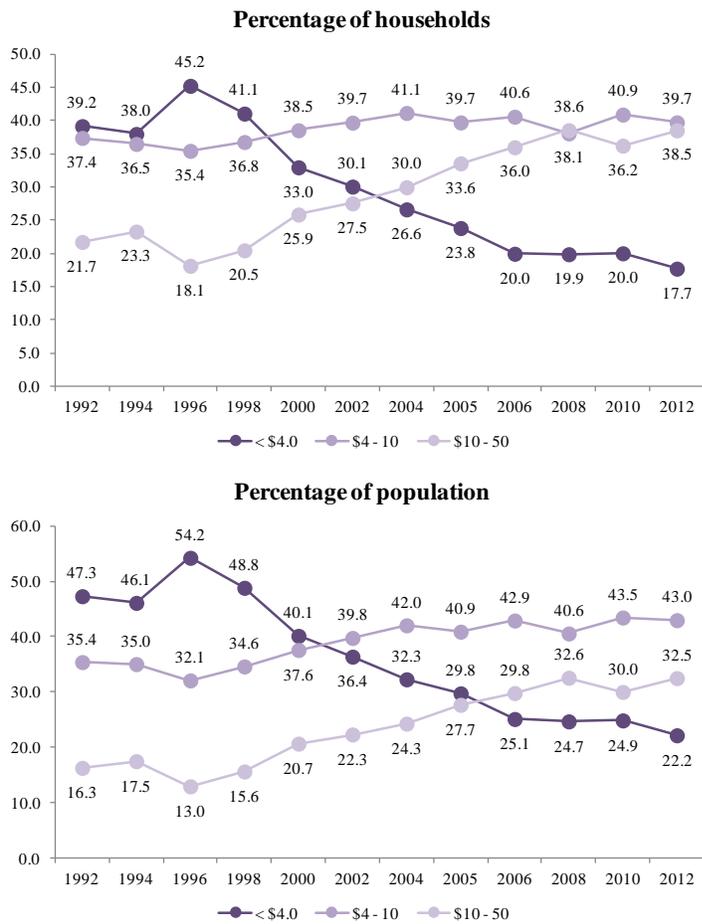
Source: Author's estimations based on ENIGH 1992-2012. Estimations are based on the net per capita income definition, used by Coneval for income poverty measurement in Mexico.

Figure 2: Decomposition of changes in poverty; c.2000-2011
(Percentages)

Mexico

11.6%

88.4%

■ Growth effect   ■ Redistribution effect

Latin America

38.3%

61.7%

■ Growth effect   ■ Redistribution effect
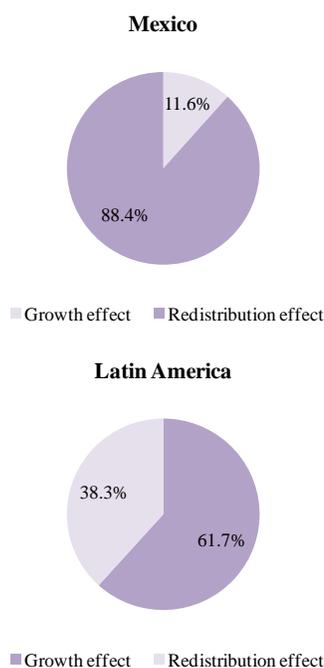
Source: Author's estimations based on data provided by CEDLAS.

Additionally, the size of the middle class (defined as living on $10-50 per capita a day) grew faster during the 2000s than during the 1990s, and since 2006 the number of people in this group has been higher than the number of people in poverty (Figure 1).

Despite these gains, about 43 percent of Mexicans remain vulnerable to fall into poverty. Figure 1 suggests that a proportion of individuals who escaped poverty did not enter the middle class, but made it only into the vulnerable group, defined as living on $4-10 a day, making it the largest socioeconomic group in the country.

Such vulnerability levels could potentially turn into poverty as a result of shocks. Successive minor shocks, highly catastrophic ones, or a combination of them, as was the case in 2008-09 in Mexico, can also run down the coping capacity of many non-poor households to the extent of being pushed into poverty. Indeed, the latest 3F crises (financial, food and fuel crisis) reasserted concerns about the need to assist those 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 fell by 6.3%; while poverty practically remained unchanged between 2008 and 2010[7], the size of the vulnerable population increased to an extent that practically corresponds to the decline of the middle class in those years.. Economic contractions negatively affect non-poor populations (e.g. vulnerable and middle class groups during the *Tequila* crisis, and the middle class during the 2009 slowdown) especially in contexts where the coverage of safety nets and insurance are relatively limited. Other potential factors include the volatility of

---

[7] The incidence of poverty slightly increased using the official poverty lines.

food prices or the proneness to natural disasters[8]. On the latter, there is good evidence that these drive people into poverty (Rodriguez Oreggia et al., 2012).

Past experience suggests that raising labor market incomes could be a policy focus against vulnerability, as they were responsible in part for the gains in poverty reduction and falling inequality, although public transfers have also played a significant role in achieving these improved social outcomes and enhancing household resilience to shocks[9]. Therefore, social protection systems should pay special attention to the vulnerable to prevent them from fall into poverty if the global economy weakens again in the future (Ferreira et al., 2012). They could support the poorer and more vulnerable by strengthening their assets and livelihoods, as well as improving their capacity to manage risk (Grosh et al. 2008). Examples include the provision of cash transfers, conditional and unconditional, workfare programs, food/nutrition aid, social insurance, social funds, and labor market policies. 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.

This paper explores the extent to which vulnerable households in Mexico are covered by public transfers, but more importantly to what extent these transfers prevent vulnerable population from potential risks.
The rest of the paper is organized as follows. Section 2 defines vulnerability to poverty. It then sets out the measure and methods employed to assess this concept. Section 3 characterizes the magnitude, evolution and traits of the vulnerable population in Mexico over the past decade, and points to some of its characteristics. Section 4 explores the incidence of various social protection programs on the vulnerable and other groups in Mexico. Finally, section 5 concludes

2. Vulnerability

2.1. Definition & 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.[10] 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

---

[8] 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.

[9] 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.

10 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 López-Calva, 2004; Rubio and Soloaga, 2004).

consensus has translated in 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) widely used in poverty assessments, and then 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 also incorporates a basic "basket of insurance" against risks. In this line, Lopez-Calva and Ortiz-Juarez (2013) 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.[11] This paper follows their procedure, summarized in next section.

It should be said that 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 (2013) 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 or out of poverty during 2002-05 using the international poverty line of $4 a day. The data was 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*,

---

11 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.

if a household has never fallen under the poverty line during 2002-05; 2) *always poor*, if it has been 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 household member, unemployment and bankruptcy of business, and the loss of housing, business, crop and livestock due to climate-related events.

In the third stage, they constructed income levels associated with the probabilities of falling into poverty using the same independent variables as in the previous step. They calculated the average of the independent variables for an array of estimated probabilities of falling into poverty. The resulting coefficients were 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, 2013). 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—; 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 3 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.
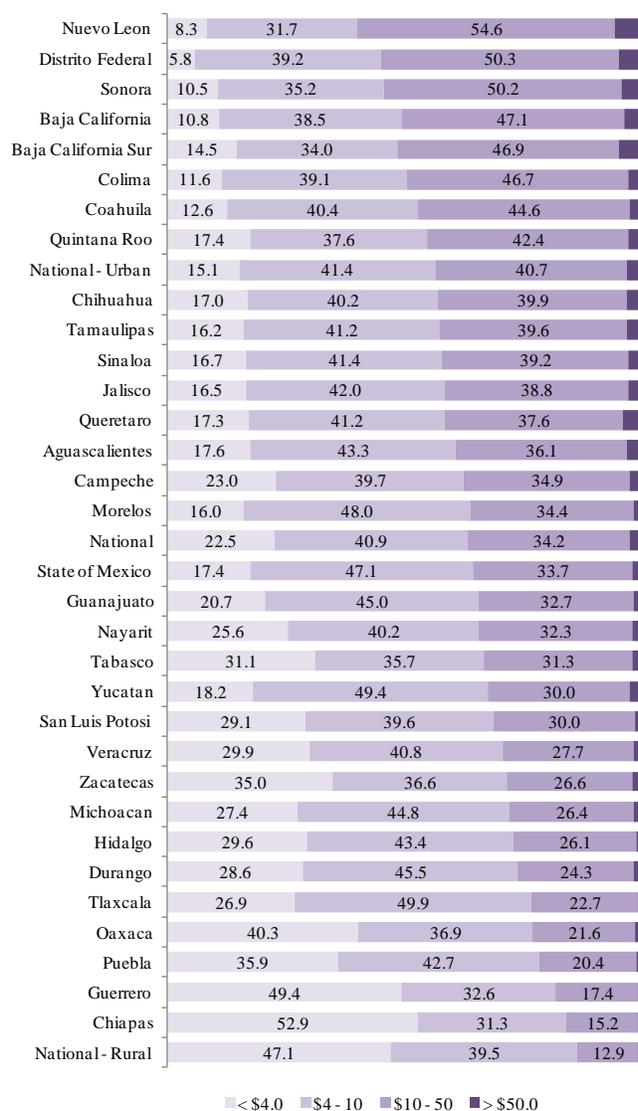
Figure 3: Distribution of income; Mexico 2012
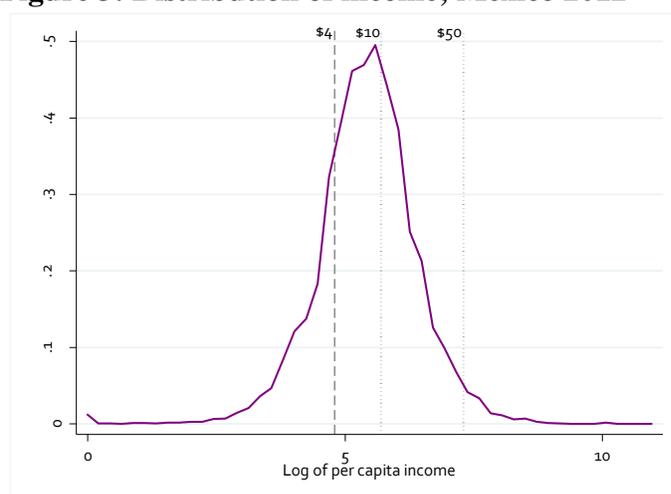
Source: Author's estimations based on ENIGH 2012

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, and it 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. .

2.3. Characterizing the Vulnerable

In part because of modest economic growth and the expansion of more progressive social spending, Mexico faced a reconfiguration of their social groups (mainly) over the last decade. As shown in Figure 1, the reduction of poverty meant that between 2000 and 2012 the Mexican middle class rose by almost 12 percentage points. Despite these results, at the same time 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 4).

Figure 4: Distribution of socioeconomic groups by states
Percentage of population; Mexico, 2012

State	< $4.0	$4 - 10	$10 - 50	> $50.0
Nuevo Leon	8.3	31.7	54.6	
Distrito Federal	5.8	39.2	50.3	
Sonora	10.5	35.2	50.2	
Baja California	10.8	38.5	47.1	
Baja California Sur	14.5	34.0	46.9	
Colima	11.6	39.1	46.7	
Coahuila	12.6	40.4	44.6	
Quintana Roo	17.4	37.6	42.4	
National - Urban	15.1	41.4	40.7	
Chihuahua	17.0	40.2	39.9	
Tamaulipas	16.2	41.2	39.6	
Sinaloa	16.7	41.4	39.2	
Jalisco	16.5	42.0	38.8	
Queretaro	17.3	41.2	37.6	
Aguascalientes	17.6	43.3	36.1	
Campeche	23.0	39.7	34.9	
Morelos	16.0	48.0	34.4	
National	22.5	40.9	34.2	
State of Mexico	17.4	47.1	33.7	
Guanajuato	20.7	45.0	32.7	
Nayarit	25.6	40.2	32.3	
Tabasco	31.1	35.7	31.3	
Yucatan	18.2	49.4	30.0	
San Luis Potosi	29.1	39.6	30.0	
Veracruz	29.9	40.8	27.7	
Zacatecas	35.0	36.6	26.6	
Michoacan	27.4	44.8	26.4	
Hidalgo	29.6	43.4	26.1	
Durango	28.6	45.5	24.3	
Tlaxcala	26.9	49.9	22.7	
Oaxaca	40.3	36.9	21.6	
Puebla	35.9	42.7	20.4	
Guerrero	49.4	32.6	17.4	
Chiapas	52.9	31.3	15.2	
National - Rural	47.1	39.5	12.9	

< $4.0 ■ *$4 - 10* ■ *$10 - 50* ■ *> $50.0*

Source: Author's estimations based on MCS-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 (Green and Hulme, 2005). 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 1 and 2 allow us to delineate some specific profiles of these groups.

The vulnerable population resides 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) and manufacturing (17 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 in a considerable magnitude. With respect to the middle class, for example, the vulnerable has a lower income (almost 3 times), and a bigger household size in 1 member, on average.

Table 1. Socioeconomic characteristics of the poor, vulnerable, middle class, and upper class in Mexico, 2012

	< $4.0	$4 - 10	$10 - 50	> $50.0	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 dissabilities	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					
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%
Educational backwardness	31.4%	20.6%	10.7%	3.1%	19.2%
Social security and medical services					
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%*
Health shocks preventing daily activities	23.2%	23.6%	24.2%	21.7%	23.7%
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%*
Quality of dwelling and acces 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%
Bienes y servicios en la vivienda					
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%
Water heater	20.3%	39.5%	66.1%	90.9%	45.5%
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%

Source: Author's estimations based on ENIGH 2012

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

	< $4.0	$4 - 10	$10 - 50	> $50.0	Total
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 employess	1.9%	6.8%	11.8%	17.5%	8.3%
Big: more than 251 employess	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%
Minning, 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%*

Source: Author's estimations based on ENIGH 2012

One relevant result from previous tables is the low coverage of "formal" channels[12] of social security and medical services for both the poor and vulnerable groups. 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[13]. These results highlight the relevance of (non-contributory) social protection strategies such as the *Adultos Mayores* program, for pensions, and the *Seguro Popular*, for medical services, that improve significantly the coverage among the poor and vulnerable in 2012.

3. Risk, vulnerability and social policy

Available evidence shows that in some contexts uninsured risk increases 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. This is why effective risk management policies in general, and social protection measures in particular, are needed.

In Mexico, the study and analysis of the nexus between poverty and risk has been partially taken in social-policy public and academic circles. In the first case, 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. However, this interest has not been followed by an identification of the vulnerable households, or empirical reports assessing fluctuations in the living standards of groups of households over time, and simultaneously tracking both the consequences of risk events on these groups and public responses to them.

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).

---

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

[13] The MxFLS dataset for Mexico allow us to observe the incidence of several shocks between 2002 and 2005 that could potentially affect welfare. The results shows that while a higher incidence of loss of crops occur among the 20% poorest households, the occurrence of health shocks for which the individual required hospitalization, or economic shocks like bankruptcy of business or unemployment is also a somewhat stable through the income distribution suggesting thus that the entire population is prone to negative shocks.

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.

With the identification of vulnerable households at a national scale it is possible to explore the incidence of various social protection programs on the vulnerable and other groups in Mexico. This section presents incidence results of some of the principal public transfer instruments in Mexico over the 2000s. The programs analyzed include basic social programs and targeted direct monetary transfers[14].

The *Oportunidades* program, Mexico's largest anti-poverty program introduced in 1997 (as *Progresa*), is a conditional cash transfer scheme covering 5.8 million poor households in 2011, with 6 million scholarships (average monthly transfer per beneficiary family in 2011 equivalent to 776 pesos, or US$88.7 a month). The *Programa de Apoyos Directos al Campo* (PROCAMPO), comprises a yearly cash transfer of 1,300 pesos (US$148.5 a month) per hectare to small-holders (under five hectares) and 963 pesos (US$110) 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$50. The *70 y más* program is a federal non-contributive pension scheme offering 500 pesos monthly (US$57) 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 has been extended to all localities in 2012 with a substantial budgetary expansion. The *Programa de Apoyo Alimentario* (PAL) was introduced in 2006 to reach the extreme poor in remote localities not reached by *Oportunidades*; in 2011 it covered 674 thousand families with an average monthly transfer per beneficiary family of 524 pesos, or US$60). Finally, the *Programa de Empleo Temporal* (PET), is a basic workfare program created in 1995 providing a maximum of eighty-eight days of work for low wage (originally 90 percent of the minimum wage, at present 99 percent). In 2009 and 2010 it 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$25.6). 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. For a more detailed analysis of the evolution of direct cash transfers over the last two decades, see Scott (2012a).

Using the dataset generated by Lopez-Calva and Ortiz-Juarez (2013), 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%.

---

[14] 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.
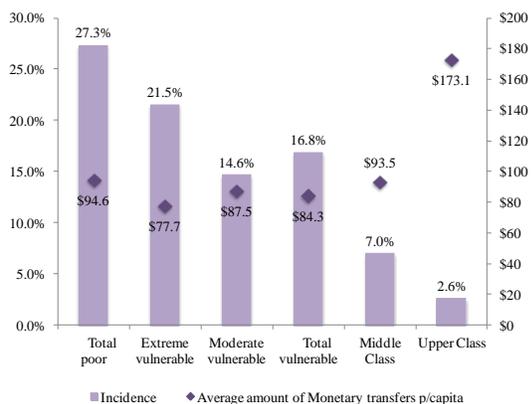
In monetary terms, the former group lives on $4-5.50 a day, while the latter on $5.50-10 a day. The incidence and benefits of programs is then analyzed for these groups. As a comparison, we also include results for the population in poverty, according to the $4 a day poverty line, the middle class ($10-50), 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.

3.1 Public Transfers and Vulnerability

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 poor population is the highest, 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) —in fact, vulnerable group is the second with the highest incidence of transfers (Figure 6). For those groups in middle and upper class, 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

Figure 6. Incidence of monetary transfers by destination and socioeconomic class
Percentage of households
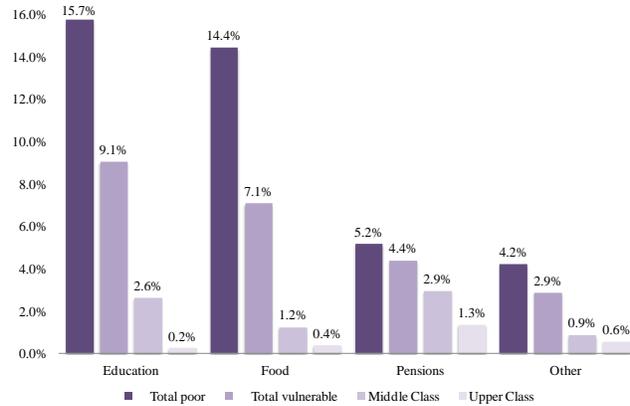
Among the vulnerable population, Figure 7 shows that direct transfers from *Oportunidades* aimed at incentivize the enrolment and assistance to all levels of education are the most important among this group (both moderate and extreme), and has been increasing in recent years (Figure 8).This result is very important itself for its potential role in 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
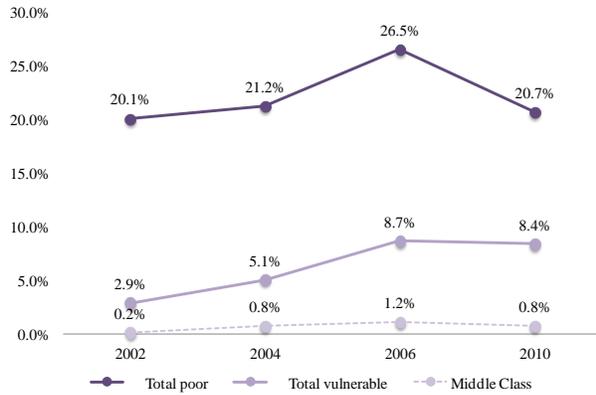
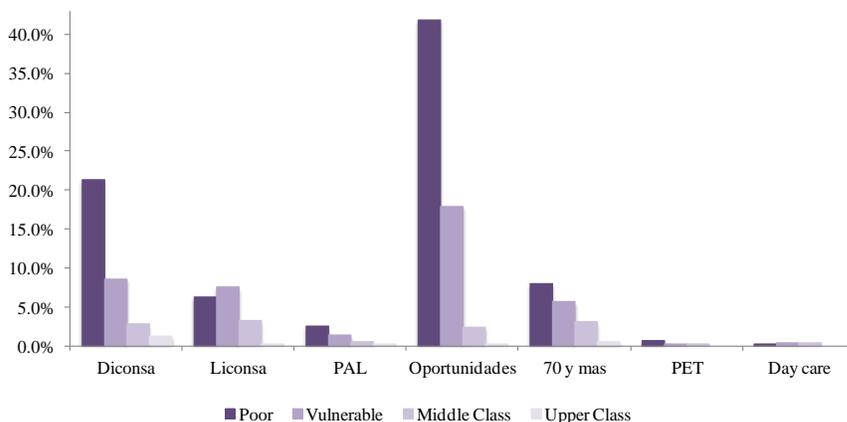*Source*: Author's estimations based on ENIGH and MPS 2010

Regarding in-kind transfers, just over 17 percent of the vulnerable population receives them, especially those aimed at improving nutrition and the acquisition of school supplies among those in extreme vulnerability (Figure 9). On the other hand, in terms of incidence of programs, the vulnerable population is significantly involved in Opportunities (18%), Liconsa (8.5%), and access to DICONSA stores (7.4%) —the participation of the vulnerable population is even higher than the population in poverty (6.2%) (Figure 10).

Figure 9: Incidence of non-monetary transfers among vulnerable population
Percentage of households
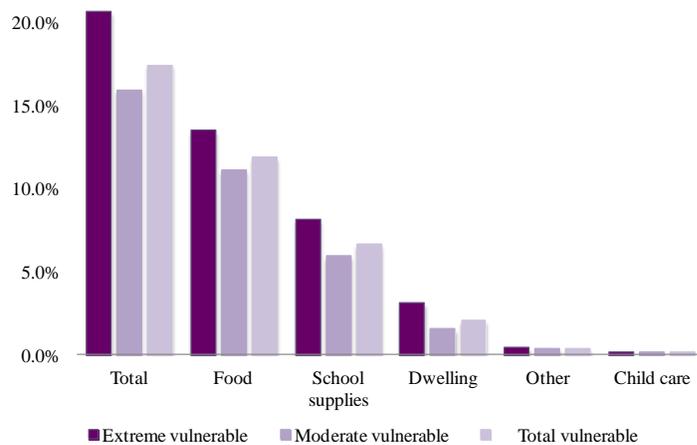
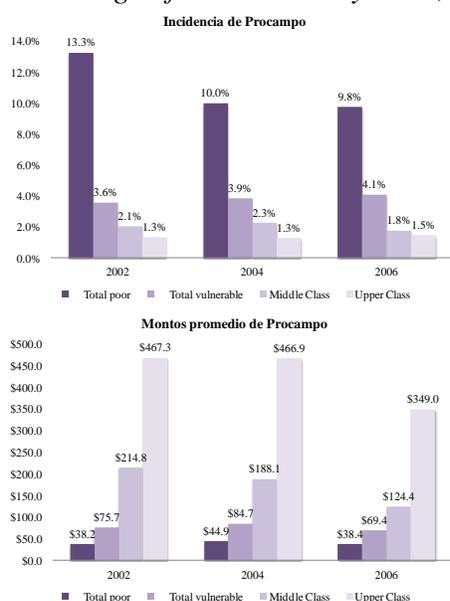*Source*: Author's estimations based on ENIGH and MPS 2010

Figure 10. Incidence by program and socioeconomic groups

In addition to these transfers, the MCS datasets reveal trends, at least during 2002-2006, of the incidence of programs aimed at improving dwelling characteristics (e.g. *Piso Firme*) and supporting the agricultural sector through *Procampo*[15]. In the case of Procampo, although the groups in poverty and vulnerability have the highest incidence, 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 (e.g. Scott 2013) (Figure 11).

Figure 11. Incidence and amount of transfers of Procampo
*Percentage of households by class, and monthly dollars at PPP*

---

[15] Other programs have a very low incidence among the vulnerable population. For instance, between 0.1% and 0.3% of the vulnerable population were beneficiaries of PET, *Opciones Productivas*, and *Credito a la Palabra* during 2002-2006. Schemes like credits and government subsidies, although their coverage has been increasing (Table 3), their incidence is very low and their impacts and scope are unknown.

While vulnerable population is covered by some social programs (which may be a targeting issue), none of these programs (with the exception perhaps of education and *Seguro Popular* whose coverage has expanded significantly in recent years, Figure 12) are oriented to protect against risks. That is, there are no specific targeted social schemes, or whose nature is, to protect these individuals.

Figure 12: Coverage of Seguro Popular; 2006-2012
Percentage of Population
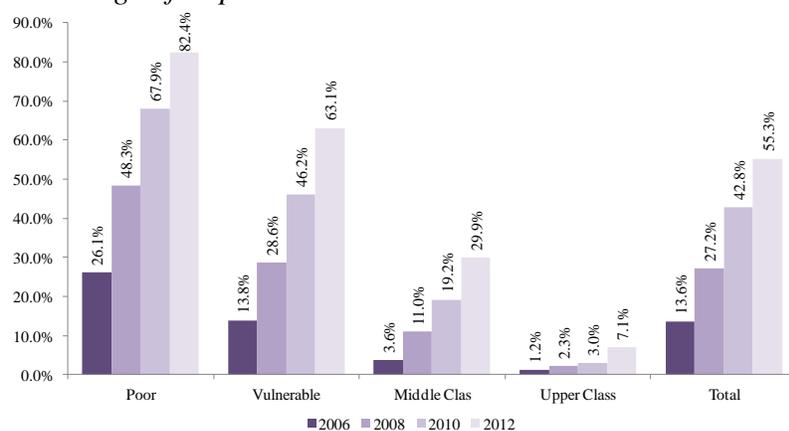
Source: Author's estimations based on ENIGH 2006-2012

Overall, beyond the extent to which vulnerable households in Mexico are covered by public transfers, it is important to note that such transfers are not designed to prevent vulnerable population from potential risks. Given this situation, a pending task for public policies is therefore to move from social transfer programs towards a universal scheme of social protection.

Table 3. Incidence and amounts of credits and governement subsidies
Percentage of households and monthly amounts in PPP

	Credits and subsidies					
	Coverage		**Amount**			
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

4. Conclusions and Next Steps

The vulnerable are the largest groups in Mexico. Over the past decade, they hovered around 30-40 percent of the population. These are people who left poverty but are not yet wealthy and/or secure enough for a place in the middle class.

Their situation probably stems from a combination of highly unsettled and low-paid employments and living in communities with poor services, which remains a protracted source of stress, and over-exposure to uninsured 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 this distinction between quasi-permanent factors and shocks is all the most relevant as the measures that would need to be taken to address each problem are very different. A 'first-best' solution would be to improve the capabilities and grant adequate entry points into labour, commodity and service (credit) markets. The provision of adequate sources of employment around communities to enhance the prospects of wealth accumulation and labour mobilization is required.

Effective risk management policies, including social protection measures, are also needed. The provision of cash transfers, conditional and unconditional, workfare programs, food/nutrition aid, life-, health- and weather-based insurance products, and labor market policies could go a long way toward mitigating the impact of risk and shocks. Many of these SP instruments already exist in Mexico. Safety nets and targeted cash-transfer programs like Progresa have been found to hold some potential to ameliorate vulnerability (de la Fuente, 2009), especially to cope with temporary misfortunes; Both factors seem to have great potential to increase the resilience of households. In this paper we concentrate on the former aspect.

Our analysis shows that social protection programs do not reach the more vulnerable…

How to tackle this situation? One option is to expand coverage of existing programs to encompass the highly vulnerable in a permanent way or to build mechanisms into existing safety nets so that they can expand support for the highly vulnerable people to fall into poverty when they need it. For instance, De Janvry et al. (2010) consider that many innovative program features already exist that could be integrated into existing or new CCT programs to give them an extended insurance function. They discuss three areas where doing this would require special attention: (i) eligibility of beneficiaries, (ii) program's effectiveness, and (iii) financial sustainability. New measures would be needed to identify those vulnerable to disasters (and likely to fall into temporary poverty). Eligible households could be determined prior to shocks using probability equations that render vulnerability scores (for instance, on the likelihood of dropping school due to a disaster). Under such modality, eligibility would only require to verify if the shock occurred, for instance, via weather-based indices. Alternatively, eligibility could be established after shocks occurred through the calculation of scores based on indicators sensitive to the occurrence of the shock. This would imply verifying if and to what extent people had been affected by a disaster.

Another options is to push for a more radical redesign of existing programs to address simultaneously the differentiated causes (structural and transient) to the threat of future poverty. Social protection interventions, which are deeply rooted in Mexico, can serve to protect the vulnerable population without a radical redesign, but also to use them as a vehicle to promote people's livelihoods, thereby reducing the vulnerability to future shocks. For instance, a gradual shift in resources and incentives from cash-transfer programmes like Progresa, in their role as safety-nets, towards those features that create more permanent forms of sustenance and allow households some long-term planning. Programs may also focus on building the assets of the vulnerable through transfers given for productive purposes such as purchase of equipment or training or to finance working capital. This helps people start a small business and reduce their reliance on moneylenders. Such transfers are not directly designed for risk coping, which would still be required to expand in times of shocks. Instead, transfers would create resilience indirectly to the extent they are successful at helping people grow and diversify their incomes and assets. Countries such as Ethiopia and Nicaragua run projects that combine cash transfers for coping purposes with livelihoods support aimed at increasing the income generating capacity of rural households exposed to climate risks. In Nicaragua, for instance, the combination of these kinds of safety nets with interventions such as vocational training and productive investment grants has proved to be effective in helping households cope with weather-related risks compared to beneficiaries of safety nets alone.

Now, introducing additional responsibilities and risk reduction measures into social protection actions could be contentious. Take the case of Oportunidades, the conditional cash-transfer program in Mexico. Numerous evaluations have confirmed its success in helping the poorest to accumulate human capital, but less so in granting an adequate transition into labor markets to its graduates (Rodriguez-Oreggia and Freije 2008). Hence, it is not self-evident that this flagship program of social policy in Mexico should expand its design to become a social protection instrument, instead of granting its youth "graduates" funds to continue into university-level studies or by connecting them to career-type employment opportunities; or simply remain faithful to its original mandate.

References:

Cafiero, C., Vakis, R.: Risk and vulnerability considerations in poverty analysis: recent advances and future directions. SP Discussion Paper 0610. The World Bank (2006)

Calvo, Cesar and Stefan Dercon. (2008) "Risk and Vulnerability to Poverty" in Nanak Kakwani and Jacques Silber (eds.), The Many Dimensions of Poverty. New York: Palgrave Macmillan, 215-229.

Chaudhuri, S. (2003). Assessing vunerability to poverty: concepts, empirical methods and illustrative examples. New York: 43.

Chaudhuri, S., J. Jalan, et al. (2002). Assessing Household Vulnerability to Poverty from Cross-sectional Data: A Methodology and Estimates from Indonesia. Department of Economics. Columbia University, Discussion Paper Series. New York: 1-25.

Christiaensen, Luc J. and Richard N. Boisvert. (2000) "On Measuring Household Food Vulnerability: Case Evidence from Northern Mali" Working Paper 2000-05, Department of Applied Economics and Management, Cornell University, Ithaca, New York.

Christiaensen, L. J. and K. Subbarao (2001). Towards an Understanding of Vulnerability in Rural Kenya. Washington, D.C., The World Bank: 1-47.

De la Fuente, Alejandro. "Vulnerability to Poverty in Rural Mexico", Unpublished manuscript, University of Oxford (2009).

Dercon, S. (2001). Assessing Vulnerability to Poverty. Report Prepared for the Department of International Development. Oxford, Jesus College and CSAE, Department of Economics, Oxford University: 1-79.

Dercon, S. (2002). "Income Risk, Coping Strategies and Safety Nets." The World Bank Research Observer 17(2 (Fall 2002)): 141-166.

Dercon, S. (2005) "Vulnerability: A Micro Perspective," in Annual World Bank Conference on Development Economics (ABCDE)—Europe 2006. (Ed.) François Bourguignon, Boris Pleskovic, and Jacques van der Gaag. Washington, D.C.

Ferreira, F., Messina, J., Rigolini, J., Lopez-Calva, L. F., Lugo, M. A., and Vakis, R.: Economic Mobility and the Latin American Middle Class. The World Bank, Washington D.C. (2012)

Hoddinott, J. and A. Quisumbing, (2010). "Methods for microeconometric risk and vulnerability assessment" in Risk, Vulnerability and Human Development: On the brink ed by R. Fuentes-Nieva and P. Seck (London: Palgrave Macmillan- United Nations Development Programme).

Kamanou, G. and J. Morduch (2002). "Measuring Vulnerability to Poverty." in S. Dercon. (ed.). Insurance Against Poverty. Oxford, Oxford University Press.

Kuhl, J. J. (2005). A Household Vulnerability Profile –Analyzing Fluctuations in Consumption using a Simulation Approach. Institute of Economics. Copenhagen, University of Copenhagen: 30.

Ligon, E. and L. Schechter (2003). "Measuring Vulnerability." Economic Journal 113(486): 1-28.

Ligon, E. and L. Schechter (2003b). Evaluating different approaches to estimating vulnerability. California: 49.

Lopez-Calva, L. F., Lustig, N. (eds.) Declining Inequality in Latin America: A Decade of Progress? Brookings Institution Press, Baltimore (2010)

Lopez-Calva, L. F. and Eduardo Ortiz-Juarez "A Vulnerability Approach to the Definition of the Middle Class" *Journal of Economic Inequality* (2013)

Morduch, J. (1994). "Poverty and Vulnerability." The American Economic Review 84(No. 2): 221-225.

Narayan, A. and C. Sánchez-Páramo. (2012). Knowing, When you Do Not Know. Simulating the Poverty and Distributional Impacts of an Economic Crisis. World Bank.

Rubio, G. and I. Soloaga (2004). "Assessing the Vulnerability of Agricultural Households to Macroeconomic Shocks: Evidence from Mexico." Journal of Agricultural and Development Economics 1(1): 45-62.

Scott, J. (2013). "Redistributive Impact and Efficiency of Mexico's Fiscal System" CEQ Working Paper Series. Working Paper #8.

Skoufias, E. (2007) "Poverty Alleviation and consumption insurance: Evidence from PROGRESA in Mexico" *The Journal of Socio-Economics* Vol. 36, 630-649

Skoufias, E. (2006) "On the Determinants of Household Vulnerability in Rural and Urban Mexico" Background study for the Urban and Rural Poverty, and the Social Protection reports for Phase II of the Mexican Programmatic Poverty Program. The World Bank, Washington, D.C., 1-82.

World Bank, Shifting Gears to Accelerate Shared Prosperity in Latin America and the Caribbean (2013)