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Catastrophes and poverty in developing countries

Par

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INTRODUCTION

The negative impacts of climate change on the natural and human environment are generally considered as a global problem (IPCC, 2007). Climactic disasters affect both developed and developing countries, with particularly high impacts on the second of these. From 1980 to 2012, losses linked to catastrophes totalled 3800 billion dollars across the world (World Bank, 2013). According to an OECD report (2012), the number of persons exposed to floods annually will increase from 1.2 billion to 1.6 billion between now and 2050. The catastrophes reduce household incomes, destroy assets and negatively impact investment in assets (Carter et al., 2007). As results, in an environment with high vulnerability and poverty, the effects of catastrophes may be enormous and long lasting. In recent years, a growing interest has been accorded to the relationship between vulnerability, poverty and resilience to climactic shocks in the context of developing countries (Berg (2009), Carter M.R. et al. (2007), Arouri, Cuong and Youssef (2014), Akter and Mallik (2013)). The assumption which generally underlies these works is that climate change aggravates the vulnerability of poor populations and therefore decreases their resilience to these shocks (Cannon, 2008; Galderisi et al., 2010).

The studies cited above are microeconomic, and very few of them seek to verify whether the conclusions obtained are valid at the level of entire developing countries. Moreover, in many cases only one type of catastrophe is addressed, whereas often there are two or more disasters hitting a country over a very short time frame, which makes it very difficult to estimate the contribution of each of these to the overall estimated impact. The present study addresses these gaps by bringing new empirical evidence to bear on the impact of catastrophes on poverty in developing countries.

EVIDENCE AND ANALYSIS

Three major trends emerge from the analysis of data on catastrophes in developing countries. First, the evolution of the number of catastrophes and the material and human damages depending on the level of development of the country show that after the 1980s, the number of occurrences of catastrophes considerably increased, most particularly in developing countries. Human damages are relatively high in these countries compared to developed countries where disasters tend to cause greater material damages. Improvements over time in information collection systems in developing countries explain, in part, the strong increase in occurrences. Climactic changes caused by humans contributed to the rapid increase in the number of catastrophes. Second, shocks are unequally distributed among regions in the developing world. They occur most often in the Pacific region and in East Asia, followed by Sub-Saharan Africa, Central Asia, Latin America and the Caribbean, then South Asia. North Africa seems to be the region which is most spared from these shocks.

Third, there is a positive correlation between the number of catastrophes per year and the incidence of poverty in developing countries. However, this positive relationship is not verified for developed countries. In effect, the incidence of monetary poverty is higher when the annual number of catastrophes is higher in the first group of countries. It goes from 37% for the group of countries where shocks occur at least 2 times per year and to 65% in the group of countries where the number of occurrences per year exceeds 6.

We use total damages and the number of persons affected as proxies of the effects of the catastrophes to evaluate their impact on poverty. Five major results emerge from the estimates.

The first is that an increase in damages equivalent to 1% of GDP leads to a nearly half-percentage point increase in the poverty rate. However, this impact is mitigated by the level of development reached by the country affected by the catastrophe (measured by GDP per capita) as well as the amount of international remittances. As for the coefficient of the Gini index, it is positive and significant, and thus shows that inequalities tend to increase the poverty rate and highlight the impact of shocks.

The second result shows that a 1% increase in the number of persons affected by a shock increase the poverty incidence by 0.00454 percentage points. This very weak impact compared to the impact of damages can be explained by the fact that destruction of household assets directly impacts their income per capita, while persons may be affected (directly) without their assets or human capital being destroyed to a significant extent. Moreover, the number of persons affected in the previous year does not significantly impact the present poverty incidence.

The third result is related to the impact of the number of persons affected by an epidemic on the poverty incidence. A 1% increase in this number in the preceding year increases the present poverty rate by 0.0239 percent. In fact, epidemics affect the income of victim households via three channels: the an increase in health expenditures relative to other lines of spending, the decrease of the level of economic activity in localities affected by the epidemic, the destruction of human capital by the epidemic.

The fourth result reports the impact of storms on the poverty incidence. The number of storms and its square are used as indicator variables of the intensity of this type of catastrophe. The coefficients of these two variables are significant but have opposite signs, which suggest that the effect of storms is not monotonic. Destruction caused by heavy rains are countered by increase in agricultural production and greater availability of pastureland for livestock.

The fifth and sixth results are related to the impact on poverty, respectively of drought and insect infestations. The results of the estimations turn up a positive impact of each of these two types of catastrophes on the incidence of poverty. The transmission channel of these shocks is a decline in agricultural productivity. Insect infestations destroy agricultural production as well pastureland. Also, the impact of drought is greater in Sub-Saharan Africa than in other regions in the developing world.

POLICY IMPLICATIONS AND RECOMMENDATIONS

The goal of this study was to explore in greater detail the impacts of catastrophes experienced by developing countries on their poverty rates. We have shown the diversity of channels via which disasters may negatively affect livelihoods. These channels have indeed worked. Our results show that catastrophes have a strong and significant impact on the prevalence of poverty. This influence is nevertheless mitigated as the country reaches relatively higher levels of development or when it benefits from international remittances. The poverty-increasing impact is statistically significant for epidemics, storms and droughts. The Ebola outbreak that struck three countries in West Africa in 2014-2015 (Guinea Conakry, Sera Leone, and Liberia) shows the magnitude of the negative impacts that an epidemic can have on the living conditions, especially the poor. The weaknesses of health systems are the main factors that amplify the impact of epidemics. Building a health system capable of preventing their spread is a priority for national health policies in developing countries. Critics against the management of the Ebola crisis by WHO also show that international organizations need to reinvent a new epidemics management policy that could make them more reactive and more effective help to victims in developing countries.

The impact of droughts on the incidence of poverty is greater in Sub-Saharan Africa than in other regions of the developing world. Agricultural policies in this continent would benefit from being more oriented toward adaptation to the decline and variability in rainfall (use of short-cycle crops, or that are more resistant to drought, extension of water saving technologies, as drip techniques, etc.). Remittances have a significant contribution to the reduction of poverty in developing countries. Policies to greater stability of these remittance flows and greater efficiency in the use of resources would accelerate the reduction of poverty and inequality in developing countries. Inequality acts in a direction opposite to that of remittances. They amplify the impact of disasters on the incidence of poverty. Strategies to build resilience to disasters should focus on income generating programs for populations most exposed to catastrophes.

But above all, accurate documentation of disasters, large or small scale, is necessary in any country. Knowing the frequency of each type of disaster, the categories of populations affected, the nature and extent of the damages, the effects of transmission mechanisms, etc. should allow the definition of a policy of prevention and mitigation of impacts. Given the importance of human and material resources that requires monitoring natural events (storms, earthquakes, droughts, etc.), increased cooperation at both regional and international levels would facilitate the collection and analysis of information needed for the definition, monitoring and implementation of quality policies for the prevention, management and disaster resilience.

RESEARCH PARAMETERS

Information concerning catastrophes are taken from the online data provided by the Center for Research on the Epidemiology of Disasters (EM-DAT). We consider hydro meteorological, biological and human in nature shocks (“extreme temperatures”, “forest fires”, “insect infestations”, “drought”, “storms”, “epidemics”, “floods” and “conflicts”). To obtain the annual poverty incidence, we first calculate the elasticity of poverty incidence with respect to GDP per capita growth rate provided by the World Bank Indicators Database. Then, we estimate the incidence of poverty for years where it is not available. The common method used in the literature to estimate the impact of catastrophes is the synthetic control method (Coffman and Noy, 2009; Cavallo et al., 2012). Due to the requirements of this method, only a limited number of countries meet them to construct a credible counterfactual. Moreover, some catastrophes occur frequently, such as hydro meteorological disasters, it is not possible to separate the impacts of successive occurrences of this type of catastrophes. So, we use generalized moments method (GMM) introduced by Arellano and Bond (1991). It is less restrictive and helps to take into account a larger number of developing countries and to verify the impact of various catastrophes on the poverty incidence across a larger number of countries.

PROJECT IDENTITY

PROJECT NAME Enhancing Knowledge for Renewed Policies against Poverty (NOPOOR)

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