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Refocusing Disaster Aid

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VIEWPOINT

Refocusing Disaster Aid

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With new modeling techniques for estimating and pricing the risks of natural disasters, the donor community is now in a position to help the poor cope with the economic repercussions of disasters by assisting before they happen. Such assistance is possible with the advent of novel insurance instruments for transferring catastrophe risks to the global financial markets. Donor-supported risk-transfer programs not only would leverage limited disaster-aid budgets but also would free recipient countries from depending on the vagaries of postdisaster assistance. Both donors and recipients stand to gain, especially because the instruments can be closely coupled with preventive measures.

Postdisaster assistance for emergency relief and reconstruction, although important for humanitarian reasons, has failed to meet the needs of developing countries in reducing their exposure to disaster risks and ensuring sufficient funds to governments and individuals for financing the recovery process. Disasters continue to impose substantial human and economic losses on the developing world. In a sample of large natural disasters over the period 1980 to 2004, fatalities per event were higher by orders of magnitude in low- and middle-income countries compared with high-income countries; similarly, losses as a percentage of gross national income (GNI) were highly negatively correlated with per capita income (Fig. 1) (*1*). Despite evidence of large returns on investments in preventive measures (*2*), most assistance arrives after the disaster. Moreover, postdisaster aid discourages prevention because of the associated moral hazard: Governments and individuals, expecting support, have little incentive to invest in precautionary measures.

The donor community—financial institutions, international agencies, nongovernmental organizations, and donor governments—is recognizing the need to place more emphasis on programs that prevent disaster losses. There is less recognition, however, of the need to support risk-pooling and risk-transfer programs that assure readily available postdisaster funds for relief and reconstruction. Lacking sufficient funds, the follow-on costs of disasters can be extensive. For example, 4 years after the devastation of Hurricane Mitch in 1998, the gross domestic product (GDP) of Honduras was 6% below predisaster projections (*3*). Donor pledges of US$2.7 billion were considered exceptionally high but amounted to only about half of the estimated total reconstruction costs (*4*).

Governments, households, and businesses in poor countries cannot easily afford commercial insurance to cover their disaster risks. Whereas low-cost microinsurance for independent risks, such as funeral expenses, is now widely available in countries like Bangladesh and India, this is not the case for dependent risks that affect many communities at the same time. The cost of catastrophe insurance is usually substantially higher than the pure risk premium, mainly because of the insurer's cost of backup capital to cover dependent claims. Consequently, people can pay more for disaster insurance than their anticipated losses over the long term. For example, in the Caribbean region, catastrophe insurance

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premiums were estimated to represent about 1.5% of GDP during the period 1970 to 1999, whereas average losses per annum (insured and uninsured) amounted to only about 0.5% of GDP (*5*). This helps explain why only 1% of households and businesses in low-income countries and only 3% in middle-income countries have catastrophe insurance coverage, compared with 30% in high-income countries (*1*). Instead of insurance, they rely on family and public support, which is not always forthcoming for catastrophes that affect whole regions or countries. Without support from insurance, family, or the government, disasters exacerbate poverty as victims take out high-interest loans (or default on existing loans), sell assets and livestock, or engage in low-risk, low-yield farming to lessen exposure to extreme events (*6*).

Developing countries cannot rely on donor aid to fill the financing gap. Humanitarian aid reported by the Organisation for Economic Co-operation and Development (OECD) Development Aid Committee is generally only a small percentage (usually under 10%) of disaster losses in recipient countries (*7*). [The $5.3 billion pledged after the 2004 Asian tsunami (*8*) was exceptional.] Moreover, promises can fall short of actual outlays. Two years after the 2001 earthquake in Gujarat, India, assistance from the central reserve fund and international sources had reached only 20% of original commitments (*9*). Because business as usual will likely not meet the postdisaster needs of developing countries, the donor community should consider refocusing disaster assistance to support risk-management programs that leverage aid with public and private contributions and that promote loss mitigation (*10*). Three examples demonstrate the potential for donor-supported risk-transfer programs.

The recently launched Turkish Catastrophe Insurance Pool (TCIP), which is similar to public-private insurance systems in France, the United States, Japan, and other developed countries, is the first of its kind to tackle the problem of insurance affordability in a middle-income developing country. Istanbul faces an estimated 0.41 probability of a severe earthquake over the 30-year period from 2004 to 2034 (*11*). In response to this risk, earthquake insurance policies are now obligatory for all property owners, who pay a risk-based fee to a privately administered public fund. To reduce the premiums and make the system viable, the World Bank provides backup capital for two layers of risk in the form of a loan with highly favorable conditions and contingent on the occurrence of a major disaster (*12*). Despite mandatory policies and 17% insurance penetration, the TCIP has not been fully successful in terms of public acceptance and implementation (and could have benefited from public participation in its design) (*13*). Still, it sets an important precedent as the first time an international financial institution has absorbed developing country risk. The donor community, too, could absorb risk in this way. Moving beyond the TCIP experience, it could provide support not just for risk transfer but for a comprehensive risk-management program, including preventive measures such as retrofitting buildings, educating the public, and enforcing land-use restrictions.

There are also innovative prospects for governments, which hold a large portfolio of infrastructure assets, to transfer their risks. Mexican authorities are planning to reinsure their national catastrophe relief and reconstruction fund (FONDEN) with a catastrophe bond. This is an instrument whereby the investor receives an above-market return when a specific catastrophe does not occur within a specified time (e.g., an earthquake of magnitude 7.0 or greater on the Richter scale in the vicinity of Mexico City over a 1-year period) but sacrifices interest or part of the principal after the event. The government's disaster risk is thus transferred to international financial markets that have many times the capacity of the reinsurance market (*14*). Although Mexico, a middle-income developing country, will finance the bond out of its own means, a similar, but donor-assisted, bond is an option for poorer countries.

Risk-transfer instruments are also emerging to address higher frequency, slower onset disasters such as droughts. In Ethiopia, where a drought resulted in the deaths of nearly one million people in 1984 (*15*), farmers may soon be able to purchase an index-based weather derivative. This is a contingent contract with a payoff determined by future weather events, such as a specified lack of precipitation measured at a weather station (*16*). Because of this physical trigger, there is no moral hazard; on the contrary, farmers have an incentive to reduce potential losses, for example, by diversifying their crops. A physical trigger also means that claims are not always fully correlated with losses, but this "basis risk" may be offset by the elimination of long and expensive claims settlements. Expedient payments will reduce the need for farmers to sell their assets and livestock to survive the aftermath of a disaster. However, despite low transaction costs, Ethiopian farmers have many other pressing needs and can ill afford to pay the costs of this hunger insurance. The affordability of the system will only be assured by the World Food Program, which has solicited donors to subsidize the premiums.

Such subsidized pilot schemes, if they can be scaled up to create a sufficiently diversified pool, hold considerable promise for the more than 40% of farmers in developing countries who face threats to their livelihoods from adverse weather (*17*). The donor community can help make these systems viable in two ways: subsidizing premiums as in Ethiopia and/or providing backup capital to reduce the risks to private or public providers.

The implementation of these public-private risk-transfer programs is now feasible largely as a result of advances in computerized modeling that make it possible to better estimate and price low-probability extreme event risks for which there are limited historical data. Catastrophe models typically generate probabilistic losses by simulating stochastic events based on the geophysical characteristics of the hazard and combining the hazard data with analyses of exposure in terms of values at risk and vulnerability of assets. For example, the TCIP is based on a model that includes the tectonic or geophysical features of the country, seismic activity (modeled according to a compound Poisson process), and the intensity of ground-shaking. Apartment buildings have been mapped according to their vulnerability to shaking and the characteristics of the soil on which they are built (*18*). In addition, there has been important progress in the mathematics of extreme value theory and in the convergence of the theories of finance and insurance, rendering possible the pricing of exotic risk-transfer instruments such as weather derivatives and catastrophe bonds (*19*, *20*). Perhaps most important, countries are developing the capacity to build these models,

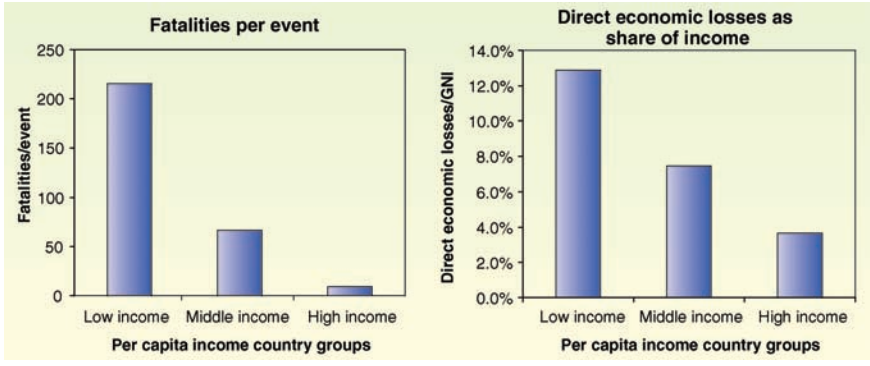

Fig. 1. Fatalities per event and direct economic losses as a share of national per capita income over the period 1980 to 2004. Country income groups according to World Bank classification using GNI per capita. Lower-middle and upper-middle income groups were combined.

which increases local knowledge about the risks and how to reduce them. On the basis of modeling and research by Turkish universities, the Turkish government is considering pilot programs to retrofit housing, schools, and other infrastructure.

If these pilot programs prove successful, they present compelling reasons for the donor community to follow the examples of the World Bank and the World Food Program and invest in risk-transfer instruments. By sharing responsibility with individuals and the state, donors leverage their limited budgets and substitute a calculable annual commitment to a risk-transfer system for the unpredictable granting of postdisaster aid. With donor-supported risk-transfer programs, developing country governments will rely less on debt financing and international donations, and assured funds for repairing critical infrastructure will attract foreign investment. Donor support will also provide poor households, farmers, and businesspersons with access to affordable means to spread risks spatially and temporally, which will secure their livelihoods and improve their creditworthiness. Most importantly, by making this assistance contingent on requirements or incentives for prevention as part of a comprehensive risk-management program, predisaster assistance can reduce the human and economic toll that disasters take on the poor. Even at extra cost, predisaster donor aid can thus be an efficient strategy if it reduces the long-term need for humanitarian disaster aid.

The need for assisting developing countries has become more pressing in light of the climate-change negotiations. As developed countries recognize that their greenhouse gas emissions can lead to increased intensity and frequency of weather extremes in the developing world (*21*), climate negotiators are seeking options for helping affected countries adapt. Specifically, the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol call upon developed countries to consider actions, including insurance, to meet the specific needs and concerns of developing countries with respect to adverse climate impacts. Providing assistance to public-private risk-transfer programs such as those in Turkey, Mexico, and Ethiopia, is an innovative option to consider (*22*, *23*).

Recent initiatives to put risk-transfer programs into place, and the role of catastrophe models in making these programs possible, are remarkable. Still, there are many challenges for implementing these programs on a large scale and ensuring that they genuinely provide affordable security to the poor. To begin, the science underlying the models and risk estimates must be independent, transparent, and viewed as reliable by insurers, investors, and donors. Despite advancements in data collection and verification with satellite technology, changes in climate, urbanization, and land-use practices create large uncertainties in estimating longer term risks (catastrophe insurance arrangements are usually short term) and add to the reluctance of the private sector to invest in risk-transfer instruments (*24*).

Beyond the formidable scientific issues, a challenge for the international donor community is to promote good governance and sound regulatory practices as prerequisites for any risk-transfer program. As cases in point, premium payments for the TCIP are placed in a segregated account, and investors in catastrophe bonds are assured payment from an internationally controlled special-purpose vehicle. Both are legally inaccessible to the respective governments. Still, corrupt practices are a risk even to clear contractual arrangements. This political risk, however, should be compared to that of ad hoc postdisaster assistance, which is more difficult to monitor and often diverted from its intended purpose.

Another challenge is overcoming the myopia of individuals and governments and their reluctance to invest in protection against low-probability disasters. Subsidizing developing country insurance programs, it can be argued, will distort prices and create the wrong signals for avoiding risk exposure. This argument, however, is hardly relevant for poor communities, which have few affordable options for relocating or otherwise reducing their exposure to disaster risk, and, lacking subsidized insurance instruments, will continue to rely on international aid. The argument against subsidies, however, underlines the importance of explicitly tying predisaster support to affordable loss prevention and phasing out subsidies as countries develop.

As these early risk-transfer schemes illustrate, the purpose of refocusing disaster aid is not to replace it with unaffordable private insurance but rather to complement postdisaster humanitarian aid with predisaster support of risk-management programs that combine prevention and risk transfer. A strong commitment on the part of the donor community and climate policy negotiators in providing expertise, capacity building, and, above all, financial support will be necessary if these programs are to make a wide-scale difference to the poor.

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