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# Coping with adversity: The macroeconomic management of natural disasters<sup>☆</sup>

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## ABSTRACT

Although the scientific evidence on whether natural disasters are becoming more frequent and more violent remains disputed, there is much less disagreement that the economic damage they inflict, in terms of the lost output and the forced migration this promotes, is large and rising. Using macroeconomic policy measures to mitigate these costs is therefore an increasingly important task in disasters-prone economies. The fundamental objective of post-disaster macroeconomic policy is to set key policy levers to return the economy to its pre-disaster path as quickly as possible without generating undue distortions elsewhere in the economy. We do not yet have a comprehensive and robust evaluation of the efficacy of macroeconomic policy responses to extreme events around the world. In the absence of such evidence, this paper draws on basic principles of macroeconomic management and evidence of best-practice experiences from the management of 'conventional' trade shocks, to outline key elements of a normative framework for the efficient macroeconomic response to devastating natural disasters. Given the relative scale of extreme events to the size of their economies and given their underlying vulnerability, these lessons are primarily of relevance to low-income countries.

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## 1. Introduction

We are living through a time of large and increasingly damaging natural disasters. Major earthquakes, in Haiti in 2010 and in Japan and New Zealand in 2011, widespread flooding in Pakistan, China, Australia and Southern Europe and hurricanes in the Caribbean and Gulf of Mexico have wrought enormous damage in terms of lives, livelihoods and property, and have led to the forced migration of millions of people (Black et al., this issue). Whether a decisive long-run trend increase in the frequency or intensity of extreme events can actually be identified from this evidence remains a matter of scientific dispute, as are the causal links to anthropogenic

determinants of climate change (see, for example, Mendelsohn et al., 2012; Schiermeier, 2012; Goodess, 2011), but what is not in doubt is that the economic costs that natural disasters place on societies are rising. Although the forecasting of extreme events and systems of disaster preparedness and response have improved very significantly in recent decades, thanks in large measure to advances in communication technologies, rising prosperity and the associated increased density of human habitation and economic activity has meant that when disaster strikes, proportionally more people and more capital are placed at risk (Barthel and Neumayer, 2011). Costs have also increased because of the greater interconnectedness of global economic activity: supply chains have become more complex and more international while

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inventories have declined as 'just-in-time' manufacturing and distribution has proliferated. The interruption of vehicle and electronics production in Europe and elsewhere when the Japanese earthquake and tsunami in March 2011 destroyed components factories in the region is only the most recent example of how rapidly the economic effects of extreme events can be transmitted across the global economy. The same is true in primary production where the globalization of markets for primary commodities now means that the impact of natural and man-made disasters can become substantially de-linked from the location of the disaster itself.

The link between extreme events and the most visible dimension of the economic dislocation they cause, namely forced or involuntary migration, was the focus of the *Foresight* (2011) project. The association between abrupt or gradual environmental change and displacement is increasingly well-documented (for example *McLeman, 2011*) but, as *Black et al. (2011)* argue, the dynamics of these mass movements are complex and hugely influenced by a range of interactions, between environmental factors and other drivers of migration and between these drivers and various 'barriers and facilitators' including a range of public policy factors. *Black et al. (this issue)* draw a particular distinction between the effects of disasters on those groups with the characteristics and capabilities to migrate in response to environmental shocks and those who are immobile and thus 'trapped' by the environmental shock.

This paper focuses on one component of the public policy response to disasters by examining how macroeconomic policy choices can be used to influence the impact and distribution of the costs of extreme environmental events, over time and between groups, including those that migrate in response to disasters and those that do not. Although the public policy response to natural disasters has multiple aspects, with the humanitarian imperative appropriately to the fore, the effectiveness of the humanitarian response will inevitably depend to a greater or lesser extent on how well-domestic and foreign resources are deployed. In terms of macroeconomic policy this notion of effectiveness can be taken to mean how well exchange rate, monetary, trade and fiscal policy instruments are deployed in pursuit of two objectives. The short-run objective is to ensure that domestic and external resources are directed to addressing the immediate needs of those affected by the crisis, while the medium term objective is to return the economy to a sustainable growth path as rapidly as possible and in a manner that causes the least possible disruption to the rest of the economic system.

Whilst macroeconomic policy instruments are primarily, and appropriately, targeted at achieving a particular outcome for the aggregate economy they are rarely distributionally neutral. The lives and livelihoods of the poorest are frequently most at risk when disaster strikes, not simply because the poor tend to live in more vulnerable locations and inhabit the less secure dwellings, but because they also lack the opportunities and capabilities, in terms of health, education, access to financial markets and so forth, to allow them to insure themselves and their assets against disaster or to migrate away from the affected location (see *Cutter, 2011* for a discussion of this in New Orleans following Hurricane

Katrina). Natural disasters therefore frequently exacerbate underlying inequalities of income and opportunity, so that macroeconomic policy instruments may also be set to seek to redress or mitigate the distributional effects of extreme events. The capacity to respond to extreme events will also depend in part on the pre-existing configuration of macroeconomic policy which, in conjunction with other aspects of disaster preparedness, will determine the range of policy options at the authorities' disposal when disaster hits.

The main objective of the paper is to identify key normative principles of effective macroeconomic management of extreme events. The focus is overwhelmingly on low-income countries and, in particular, smaller developing countries both because these countries tend to be the most vulnerable – they are often poor precisely because their vulnerability to extreme events acts as a brake on rapid capital accumulation – and also because it is in these economies that the payoffs to good macroeconomic management are highest and the costs of poor macroeconomic management the greatest. This is not to downplay the relevance or importance of effective economic management of disasters in larger and richer economies but in these environments natural disasters tend not to have overtly macroeconomic consequences, even if they are more devastating in absolute terms. Thus while Hurricane Katrina which struck New Orleans in 2005 was immensely devastating at a local level and (eventually) triggered a decisive economic response through the US Federal Emergency Management Authority, the macroeconomic impact on the overall US economy was nugatory, at least beyond the very short run.<sup>1</sup> By contrast, the storm surge that afflicted the small island economy of St Kitts and Nevis in October 2008 damaged very little of the infrastructure but put paid to income from tourism for a whole season which had very significant macroeconomic consequences for that economy. Moreover, since few low-income countries have the capacity to respond to extreme events on their own, external assistance inevitably plays an important role in mitigating the effects of extreme events. In such circumstances, an appropriately designed macroeconomic framework is vital to ensure that external financial flows can be effectively mobilized as part of a disaster management strategy.

A number of caveats are necessary in order to frame the analysis in this paper. First, it is important to draw a distinction between the conventional short- and medium-run domain of macroeconomic management on the one hand, which is concerned with influencing the path of the economy given its fundamental environment, structures and institutions, and the longer-term deep determinants of the underlying growth and resilience of the economy on the other. This paper focuses on the former and therefore does not discuss the interaction between climate change, structural economic transformation and permanent migration, nor does it discuss detailed questions of adaptation to climate change. Where the

<sup>1</sup> US GDP did not decline at all as a result of Katrina and although the growth rate dipped slightly relative to forecast in the second half of 2005 it more than recovered in the first quarter of 2006. Much of the decline in output was, in fact, due to the interruption to natural gas production in the Gulf of Mexico (US Department of Commerce, Bureau of Economic Analysis GDP data).

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