Comment on:

Landis MacKellar, Paul Freeman, and Tatiana Ermolieva,

"Disaster Losses and Long-Term Economic Growth"

By Thomas C. Schelling

The primary purpose of their paper is to explore alternative ways to cope, financially, with the large losses ("downward shocks" to the capital stock) that may occur unpredictably from natural disasters. Its point of view is that of a poor country, in which much of the loss may be from damaged or destroyed infrastructure. For that purpose the authors introduce a "neoclassical" production function, the core of which is Cobb-Douglas. I believe the model significantly understates the magnitude of the problem. I am not sure that in doing so it invalidates any of their conclusions. My interest, in this comment, is only in the nature of "downward shocks" due to "disaster."

The say in annex 2, "The main impact of a downward shock to the capital stock (*which we assume to be spread uniformly across all capital*) is lower GDP …." (My Italics) Earlier, in the main text, they say, "As illustrated in Figure 1, if destroyed capital is not replaced, GDP simply returns to the same growth path at a lower level."

A neoclassical production function assumes that investment is optimally distributed over the capital stock to maximize incremental production and, hence, return. The capital stock at any time represents a collection of assets such that to replace any particular asset with another chosen at random would give a negative return; it would "unbalance" the collection of assets. And this should be true within the firm and among firms and, preferably, with respect to publicly owned capital as well. A downward shock to the stock of capital, resulting from a natural disaster, is unlikely to be optimally distributed among all forms of capital. If it were—and that is probably what the authors mean by "uniformly distributed across all capital—it would merely undo the most recent increments in capital, with the result they refer to—back to where we were some time before with an optimal but smaller collection of assets. But we cannot expect natural disasters to be as careful in partially disassembling the capital stock as the investors were in assembling it.

The ensuing reduced GNP should therefor not be "the same growth path at a lower level," i.e. resumption of the same growth path set back some years in time. The drop in GNP should be greater than the production function would yield with mere subtraction of the lost capital value. And the ensuing recovery should reflect both the high marginal productivity of replacement investment that restores the productive balance of the capital stock, and the high cost of replacement assets due to reduced productivity in the damaged capital-goods industries.

These considerations suggest that a production function designed to capture the effects of disaster--of a capital-destroying shock--needs to be disaggregated sufficiently to identify the kinds of capital most susceptible to various disasters and the impact their specific loss will have on the rate of recovery, perhaps with special attention to publicly financed infrastructure.

Whether these considerations also affect the policy conclusions regarding the ex ante and ex post methods of financing post-disaster recovery I cannot tell.