

On the Sensitivity of Impact Estimates for Fixed Ratios Assumptions

Topic:

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Firms react to shortages in the supply of their inputs by looking for substitutes. We investigate the impact of finding such substitutes on estimates of the size of the regional and national disaster impacts. To investigate this issue, we use the German multiregional supply-use table (MRSUT) for 2007, together with data on the direct impacts of the 2013 heavy floods of the German Elbe and the Danube rivers. We start with a non-linear programming model that allows for maximum substitution possibilities, and observe little to no indirect damages in the directly affected regions, whereas negative indirect impacts of a magnitude of 5%-7% and of up to 34% occur in other German regions and abroad, respectively. Adding the increasingly less plausible fixed ratios that are commonly used in standard Type I and extended Type II multiregional input-output and MRSUT models to our model, results in (1) substantial increases in the magnitude of negative indirect impacts and (2) a significant shift in the intra-regional versus interregional and international distribution of these impacts. Our conclusion is that input-output models tend to grossly overstate the indirect damages of negative supply shocks, which are part and parcel of most disasters.