

## **The limiting distributions of (country) responsibilities**

Topic: IO Theory I (Chair: Umed Temursho, IOpedia and University of Central Asia)

Author: Umed TEMURSHO

This paper starts with exploring the conceptual correspondences of the most salient input-output (IO) responsibility indicators with the well-understood and widely used aggregate economic performance measures. Such approach of simultaneous examination of the circular flows of incomes and of emissions for an open economy clearly demonstrates the uses and limitations of each of the considered IO responsibility measures. As a by-product of this analysis, a disposable income-based accounting as a new responsibility allocation scheme is introduced.

Next, we show that there are two entirely legitimate ways of computing both the consumption- and income-based emissions, whereas the literature discusses and applies only one of such alternative expressions in each case. Here two types of allocation matrices play critical role, which we refer to as "factor to final users allocation matrices" and "factor to primary suppliers allocation matrices". The properties of these matrices are explored in some detail.

Finally, we study the issue of infinite redistribution of responsibilities between final (output) users and primary (input) suppliers, as namely these economic agents ultimately manage and operationalize production units. It is shown analytically that the process of such repeated redistribution of responsibilities is finite. In particular, the limiting or "stationary" distribution of a country's final users responsibility is given by the country gross national expenditure (GNE) share in the world GNE, and that of primary suppliers responsibility equals the country share of gross national income (GNI) in the world GNI. If one does not distinguish the countries of origin of primary suppliers in the value added quadrant of the global multi-regional IO table, the latter limiting distribution equals the proportion of the country gross domestic product (GDP) in world GDP. The implications of the discovered limiting distributions of environmental responsibilities are discussed in the context of international cooperation on climate and in relation to the equitable burden-sharing frameworks widely used by climate scientists.