Distance-based shared responsibility

Topic: Methodological aspects of input-output analysis II
Author: Umed Temurshoev
Co-Authors: Ronald E Miller

In operationalizing Gallego and Lenzen's (2005) upstream (downstream) shared producer-consumer (producer-worker) responsibility input-output model, Lenzen et al. (2007) (resp. Lenzen, 2008) proposed pegging the required upstream (downstream) sharing parameters to value added (final demand) because this approximates the extent of producers' control over the production recipe (sales structure). In this paper we consider alternative distance-based choices for the sharing parameters. For the upstream responsibility we suggest approximating the sharing parameters by the inverse of sectors' average distance from their primary inputs providers in the input demand chain (Miller and Temurshoev, 2013). The reasoning for such a choice coincides with that of Lenzen et al. (2007): if the distance between producer i and its primary inputs suppliers is small, then it must be the case that producer i adds significant value to the product in its production process compared to another producer k who is positioned much farther away from its providers of primary inputs. This implies that producer i has higher influence over production processes, hence should be levied with larger responsibility share. Similarly, for the downstream responsibility we propose as a proxy of the sharing parameters the inverse of sectors' average distance to their final users in the output supply chain (Antras et al., 2012). The argument for such a choice is that the shorter the distance between producer i and its final users, the larger proportion of its output it sells to final demand, hence the higher influence it has over sales and advertising, and subsequently it should be levied with a larger share of downstream responsibility, which is also consistent with Lenzen's (2008) reasoning. In our empirical exercises we compare the distance-based shared responsibility outcomes with those where the sharing parameters are pegged to value added and final demand, and also analyze the sensitivity of the results with respect to aggregation.