

Communities in world input-output network: Robustness and rankings

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Abstract

We introduce a method for assessing the robustness of community detection and apply it to a world input-output network (WION) to obtain economically plausible results. This method enabled us to rank communities in the WION in terms of their robustness and stability. The algorithmic assignment variability index proposed in this study is shown to have predictive power in terms of forthcoming community rearrangement. We also provide several new approaches for identifying key economic communities. These approaches are based on the application of several centrality measures to a synthetic network in which nodes represent WION communities. Using these methods, we show that in 2000–2014, United States and Japan-centered communities demonstrated decreasing trends, while the importance of the China-centered community predominantly increased. A notable feature of the Germany-centered community rank evolution is that its influence grew only as a result of the inclusion of the Netherlands and Belgium in 2013.