A dynamic approach to input-output modeling:

Abstract:

Previous frameworks for input-output modeling have made the assumption that flows into and out of each economic sector balance, such that there is no accumulation of economic factors or embodied energy within any of the sectors. This may be an adequate assumption for a sector of the economy operating at `steady-state', however the assumption introduces errors for example in analysis of sectors that are growing rapidly, where a non-negligible proportion of input factors may be invested in accumulation within the sector. This paper presents an extension to the traditional input-output framework, wherein accumulation is incorporated explicitly using a dynamic (transient) analysis method. This new approach gives new insight into macro-economics including an alternative metric for social development. It also raises issues for input-output-based methods for net energy analysis. The alternative perspective offered by this new method is used to explore the implications of extraction of declining quality resources from the environment.

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