# On the simultaneous estimation of physical and monetary commodity flows

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***Abstract***

Large databases mapping commodity flows measured in various units such as currency, tons or caloric values are the backbone of many recent environmental-economic studies. Their construction typically requires combining large amounts of partial information in a series of successive steps. These include the estimation of unobserved flows, transformations between units, handling aggregation re-classification, and, finally, reconciling estimates with mass-, financial- and/or energy-balances. This paper proposes a maximum entropy model that allows for the simultaneous estimation of unobserved commodity flows as well as corresponding prices such that data constraints in various units of measurement, levels of aggregation and possibly mismatching classifications are simultaneously satisfied. Its capability is assessed through a Monte-Carlo analysis and its performance compared with simple step-wise approach. Our results suggest that the simultaneous approach performs significantly better in vast majority of cases.

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