Bridging the gap between stock-flow consistent models, input-output analysis and environmental accounts: an empirical application to the case Colombia

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Both the stock-flow consistent (SFC) approach and input-output (IO) analysis share the feature of describing the economy as a web of interactions between social and economic agents. This way of understanding economic processes provides much richer insights than the more mainstream approaches based on methodological individualism, where structural features and sectoral and agent heterogeneities are mostly lost in the abstraction of the representative agent. Moreover, SFC and IO analyses are strongly grounded on national accounting, ensuring the fulfilment of key accounting identities that help guarantee the coherence of the results generated by the models. However, there are a number of differences that have kept SFC and IO analysis as two separate modelling strands. First, while SFC models have mostly assumed a single-good economy, IO models are multisectoral by definition. Second, since most SFC models have been developed by scholars belonging to the Post Keynesian school, production has been assumed demand-led with little attention to potential supply-side constraints. Although in IO analysis production can also be considered demand-led, their multisectoral description of the economy allows for a much more detailed analysis of the supply-side implications of a specific vector of final demand. Third, while IO models tend to be static, the SFC approach emphasizes the importance of understanding the economy as a dynamic process. Finally, while IO models focus on the real side of the economy (mostly on production relationships), SFC models have mostly prioritized the description of current and financial transactions.

The aim of this paper is to build a bridge between these two different though complementary modelling approaches using Colombia as a case study. To do this, we combine the Integrated Economic Accounts (IEA) provided by DANE, usually used in the SFC approach, with the IO tables provided by OECD Stat. This requires making several assumptions to harmonize the notion of "institutional sectors" used in the (IEA) with the activities reported in IO tables. The most challenging task is to define a balance sheet and a flow-of-funds for the different productive sectors in which the "nonfinancial corporations" sector is disaggregated. The balance sheets of individual firms published by the Ministry of Trade are used to do this. This data is further used to make the required assumptions to define interest payments for each productive sector. Moreover, the satellite environmental account is used to incorporate each productive sector's greenhouse gas emissions. All these data sources and decision criteria to harmonize them are combined to build an empirical SFC-IO model for Colombia for the period 2005-2018. We expect this paper to contribute to the economic modelling literature by establishing a clear methodological procedure on how to combine the different data sources required to build an SFC-IO model.