

## **A Prototype empirical Stock-Flow Consistent Input-Output Ecological model of the Italian economy**

Topic: Recent Developments in Stock-Flow Consistent Input-Output Modelling - III

Author: Francesco Zezza

Co-Authors: Giacomo Cucignatto, Giuliano Toshio Yajima

This work aims at establishing a research agenda for building an empirical, multisectoral macroeconomic policy model for Italy. This country currently faces multiple challenges in both its productive structure and in its public finance outlook, as it set to move towards a different energy mix while reaffirming its commitment to bring down its government deficit and debt. We argue that these medium-term objectives are at odds, as narrowing the budget deficit could endanger investment in energy transition. Moreover, to quantitatively assess the risks and opportunities of this dual policy, an evaluation tool that accounts for the dynamic inter-relations between the real economy, the industrial structure, the financial sector, and energy resources still needs to be designed.

To do so, we draw upon two streams of applied macroeconomic literature, namely Stock-Flow Consistent (SFC) models and Input-Output methodologies. SFCs are dynamic, medium-scale Keynesian macro-econometric models based on a rigorous accounting framework (Godley and Lavoie 2007; Nikiforos and Zezza 2017). The model consistency can be identified in four principles (Zezza and Zezza 2019): (i) flow consistency, i.e., every flow must come from somewhere and go somewhere else – for example, in an open economy model, exports of one country are the imports of another one; (ii) stock consistency, i.e., every asset owned by an agent (sector) is the liability of another one (or more) in the system; (iii) stock-flow consistency, i.e., every flow implies the change in one or more stocks; (iv) quadruple entry principle, i.e., every transaction is recorded four times in the accounting matrix, twice as a flow of expenditure and twice as a change in balance sheets. Input-output analysis, on the other hand, is a practical extension of the classical theory of general interdependence which views the whole economy of a region, a country or the entire world as a single system and sets out to describe its operation in term of directly observable basic structural relationship (Leontief 1987). Input-output analysis dissects the main industrial blocks of an economic system, as well as the transmission mechanisms inherent in the production process, indicating the structural characteristics of such a system (Garbellini and Wirkierman 2014). Leontief’s sectoral and disaggregated perspective is useful to provide a quantitative description of the structural properties of the various components of the economic system. If the standard Keynesian analysis considers the multiplier process through the consumption function - that is, via the income-expenditure channel, the IO approach focuses on a different aspect of the process, i.e., that relating to the production process of intermediate goods within the circular flow and therefore to industrial interdependencies (Miyazawa 1960).

We contribute to the existing literature in multiple ways. First, we discuss how to extend the model of the Italian economy presented in Zezza and Zezza (2022) to include an I-O structure with 15 industries, using multiple data sources (i.e., the financial and non-financial accounts of institutional sectors and I-O tables, provided by Bank of Italy and Istat), and how to coherently connect these different accounts. The SFC structure of the model features six-institutional sectors, and details transactions for stocks and flows of 3 financial assets/liabilities and their feedback effect on real variables. Second, we provide an overview on how to develop the extended accounting framework further, to also include Energy Balances data (provided by Eurostat). Finally, we provide a first assessment of the potential uses for such a framework, discuss its limitations, and possible avenues for further extensions.

Keywords: Stock-Flow Consistent models; Input-Output Approach; Italian Economy; Energy Balances

JEL: C67; C50; Q43

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