Modeling Transition Pathways through Environmental Stock-Flow Consistent Input-Output Models: the case of Argentina

Topic: YSI and Development Programme - IV - Discussants: Bart Los and Rosa Duarte
Author: Sebastian Valdecantos

In December 2020, Argentina updated its nationally determined contributions (NDC) of greenhouse gas emissions to 359 million metric tons of CO2 equivalent in 2030, which is 25.7% lower than the initial target set four years before. Being the new NDC target roughly equal to the current level of greenhouse gas emissions, the fulfillment of the target finds the country at a crossroads: either it remains stagnant or it shifts its productive structure away from high emitting activities, like agriculture and cattle raising, which would entail severe consequences in terms of the balance of payments. As a result, the country finds itself in a trilemma where given its economic structure the simultaneous attainment of moderate (not even high) economic growth, external and environmental sustainability is not feasible. A possible way out of this trap would consist of undertaking a process of structural change based on the energy sector, in such a way that all the emissions except for the ones coming from the primary sector are significantly reduced.

The goal of this paper is to build an empirically calibrated model that is capable of representing the multiple processes underlying the trilemma that Argentina and, most likely, most Latin American economies face in the context of the green transition. Such a model needs to account for the sectoral specificities of the economy as well as for the interactions between the economy, the environment and the financial side (mainly the one linking the economy to the rest of the world), and at the same time overcome the problems that have render IAMs useless for policy-making purposes. The model developed in this paper is an Environmental Stock-Flow Consistent Input-Output Model (ESFCIO) disaggregated at 31 productive sectors for the year 2017, which social accounting matrix is extended to incorporate the greenhouse gas emissions of each productive sector and the financial assets and liabilities of each institutional agent, thus obtaining a modeling tool that integrates production, income, financial and environmental accounts in a consistent way. The model is used to simulate two different scenarios of a transition toward a more sustainable economy, one where all productive sectors increase their energy efficiency and reduce their production-related emissions and another one where the transition is led by the most relevant sectors in terms of exports, employment generation and greenhouse gas emissions. The results of the simulations show that a stable green transition is possible, although conditional on a regular flow of financing during the period that structural change takes place.