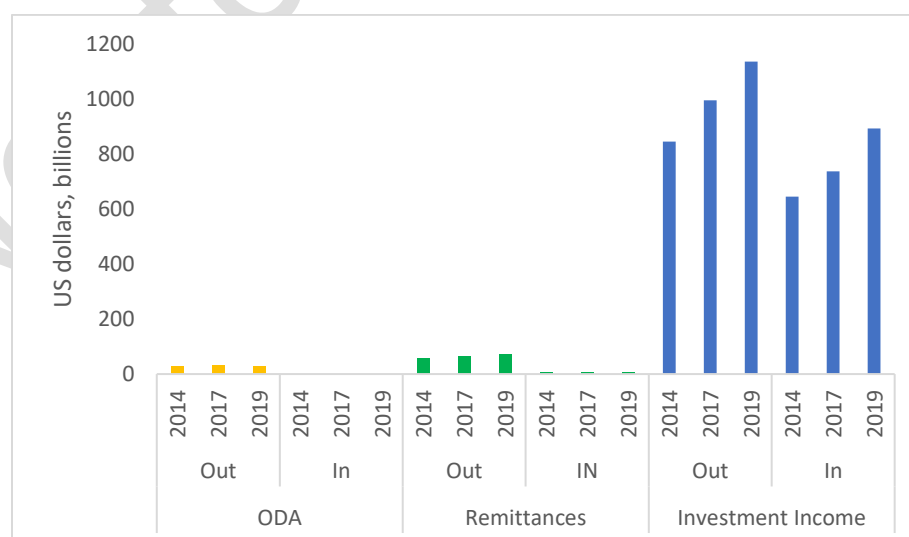


The Global Trade Analysis Project (GTAP) Data Base encompasses data for various countries and regions (Aguilar et al., 2023). The Data Base integrates international data into Input-Output Tables (IOTs) and updates them to reflect recent economic activities for specific reference years. One of the economic indicators that can be found in the Data Base is savings by country. The key macroeconomic condition related to savings used in the GTAP Data Base is the alignment of the savings-investment balance with the trade balance. This is achieved by targeting exports and imports in the Data Base construction and adjusting investment to ensure consistency with Gross Domestic Product (GDP) levels. Consequently, the level of savings is determined as a residual value. It is important to keep in mind that these savings figures represent net savings, not gross savings. While in static economic analysis, these savings figures may not significantly impact results, they become more crucial in dynamic analysis. However, in both previous and the latest versions of the GTAP Data Base (GTAP 11), it's observed that several countries report negative net savings. This could lead to numerical instabilities in dynamic simulations or some distortion of the results.

To better understand and refine savings within the GTAP framework, we intend to incorporate remittances (in and out) (WB 2023), foreign flows (receipts and payments) (IMF 2009), and international foreign aid flows (in and out) (OECD, 2022) into the standard GTAP model (version 7). The inter-regional flows collected, with the case of the United States of America as an example, can be seen in Figure 1. Then we plan to contrast the outcomes obtained against its extended counterpart, the MyGTAP model, which is described next. We want to better understand the potential differences between the MyGTAP model and the GTAP standard in terms of savings. We will also be able to acquire some practical understanding of each model's distinct characteristics and behaviors, and how each one reacts to a stylized shock. This data-driven approach enables the conduct of a meticulous comparative analysis, shedding light on the different methodologies and their effect on savings.

Figure 1. Inter-regional flows - United States of America



Source: WB, 2023; IMF, 2009; OECD, 2002

MyGTAP extension is a tool focused on a single country that offers the possibility of a more detailed accounting system for the GTAP regional household, as well as adding various inter-regional transfers. This offers more flexibility to the user in the treatment of government savings and spending, makes available inter-regional flows such as remittances and foreign capital incomes; and allows for shocks on different households and factors within the relevant economy, for which they have additional data.

In the standard GTAP model, a single regional household aggregates all income from factors and taxes, allocating it among private consumption, government expenditure, and regional savings using a Cobb-Douglas function. In contrast, MyGTAP replaces this regional household with separate government and private households. The government accrues income from taxes, foreign aid, and other transfers, utilizing these funds for consumption and savings, while private households receive income from factors, including foreign remittances and capital, for consumption and savings.

While regional savings in MyGTAP is still calculated as the sum of private household savings and government savings, and it is allocated to investment similarly to the GTAP model, it is important to note that the value of savings in MyGTAP differs from the standard GTAP Data Base due to the inclusion of remittances and other foreign transfers. These additions may impact incomes without affecting expenditures on commodities.

Another difference, crucial for this study, is that MyGTAP already incorporates inter-regional transfers, such as labor remittances, foreign income on capital, and foreign aid, within its modeling framework. These flows are not bilateral but instead, flow in and out of individual countries/regions as provided. Consequently, remittances, foreign income, and foreign aid are intricately linked to government and private household incomes.

After the modification of the standard GTAP model (version 7), and to make a valid comparison between the standard GTAP (with the inter-regional flows) and the MyGTAP we will implement a stylized shock in each model. We consider this to be useful due to the close relationship that the standard model has with the recursive dynamics model GTAP-RD. To illustrate those differences, we plan to implement a free trade shock in agricultural goods, with the United States as the case study. Making this comparison between the standard GTAP and MyGTAP will help us the presence of negative savings in some countries in the GTAP Data Base.

By navigating the nuanced differences between these models and scrutinizing their implications within a stylized simulation, this research allows us to equip policymakers and researchers with valuable insights into the intricacies of the dynamics of economic modeling, thus expanding their capacity for informed decision-making.

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