

APPENDIX G

Country Computable General Equilibrium Models

Chapter 7 presents a set of exercises using a computable general equilibrium model, or CGE (Chisari, Maquieyra, and Miller, 2012; Chisari, Mastronardi, and Vila Martínez, 2018). The basic structure of the model consists of approximately 30 productive sectors on the supply side of each economy. On the demand side are five representative households (with different income levels) and the government. Economies are open to commercial and financial trade with the rest of the world. The models are numerical representations of the conditions of aggregate equilibrium in the economies. In each of the markets, producers and consumers interact according to behaviors that are established through production functions and consumer utility functions. Prices of goods and services are computed every period to clear all markets simultaneously. Producers and consumers carry out transactions in the markets for goods and productive factors. For example, on the production side, firms purchase intermediate inputs from other sectors, earn revenues from domestic and foreign sales, remunerate the factors of production, and pay taxes. On the demand side, workers receive their salaries—which are an important component of household income—consume, and invest. The government collects revenues from taxes and consumes and invests. The model estimates the changes in relative prices needed to clear the markets in compliance with Walras Law. Those price changes, in turn, influence the path of economic growth in each economy through the reallocation of resources among the economic sectors. They also lead to modifications in the structure of the economy, and in income distribution. The model is *recursive dynamic*, meaning that economic growth is the result of the savings of the agents who, in turn, make investment decisions following their current (rather than future or anticipated) income and factor remuneration.

“Calibrating” a CGE model to a specific country requires a Social Accounting Matrix (SAM). The SAM is a representation of the flow of all economic transactions that take place within an economy in a year. At its core, it is a matrix representation of the National Accounts of a country. It is represented in the form of a double entry box (or matrix) with the income of each sector in the rows, and the expenses in the columns. SAMs refer to a single year providing a static picture of the economy, which is the starting point for the recursive analysis. For the models used in this report, the base year is 2015. The accounting

of the entries in the matrix must comply with the basic budget restrictions (i.e., income equal to expenses). Once the accounting and functional structure of the economies has been defined using the SAM, the model must be fed, or “calibrated.” The first step is to compute an initial equilibrium (also known as “empirical equilibrium”), which will serve as a benchmark for the simulations. In other words, the “new equilibrium” that is obtained every time a simulation is run is compared with the initial equilibrium. The simulations are also known as “counterfactual exercises.”

References

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- Chisari, O. O., L. J. Mastronardi, and J. P. Vila Martínez. 2018. "El efecto de la infraestructura en el desempeño de seis economías de América Latina: una evaluación con Equilibrio General Computado." Inter-American Development Bank, Washington, DC. Unpublished.

