Analyzing Important Elasticity Parameters of a Korean CGE Model

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Although Computable General Equilibrium (CGE) models are now widely used in fields of energy, environment and economy to assess policy impact, they are often criticized as most key parameters are not econometrically estimated. Since the models are often large in scale, however, econometric estimation of parameters is costly, particularly in constructing huge database. Identifying important parameters would be useful as resources and information could be efficiently concentrated on them. This paper employs a novel approach of Belgodere and Vellutini (2011) to the identification of important parameters of an economy-energy-environment CGE model for the Korean economy. In the approach, (i) after a CGE model is constructed, parameter values denoted as X are randomly drawn via a Monte Carlo simulation, (ii) outcomes of the CGE model, denoted as Y, are calculated given the parameter values, (iii) the procedures are repeated N times to yield sample data of X and Y with size N, and (iv) finally a standard regression analysis estimates and tests the relationship of X and Y. Using the approach, this paper illustrates how to identify and rank key parameters of the Korean CGE model in impact analysis of an emission reduction policy. We depart from BVâ€™s framework in several points. First, BV used an economy CGE model for Cameroon, in which the impact of Economic Partnership Agreement (EPA) with the EU was assessed. We construct an economy-energy- environment CGE model for Korea and consider the impact of an emission reduction policy. Second, BVâ€™s model had four classes of elasticity parameters; demand elasticities for each of 42 commodities, elasticities of factor substitution, Armington elasticities, and finally transformation elasticities. Our model is more complex, having 20 classes of elasticity parameters, although commodities are classified into 37 ones, less than BVâ€™s 42. Finally, BV just identified statistically significant parameters in the applied model, while we rank key parameters in order of their standardized influence on model results in addition to the identification.