

This paper uses a powerful methodological approach in order to assess several policy options for Armenia regarding the liberalization of trade and foreign direct investment (FDI) in services. In particular, it assesses the potential impact of a Deep and Comprehensive Free Trade Agreement (DCFTA) with the EU, FDI liberalization in services with the countries of the Commonwealth of Independent States (CIS), and other unilateral agreements.

The authors develop a 21 sector and 4 region (Armenia, EU, CIS and ROW) computable general equilibrium (CGE) model. This process has involved a huge effort in data collection, including, among others, the construction of a balanced input output table and the estimation of Barriers to FDI.

One of the most innovative features of the model is that it allows for the presence of FDI and multinationals (MNEs) in some services sectors. This, together with a Dixit-Stiglitz-Ethier mechanism in imperfectly competitive sectors, leads to potential increases in both consumers' welfare and producers' productivity. The latter being due to the possibility of obtaining a quality adjusted unit of services at a reduced price when there are more varieties (i.e., more firms producing those services). Another important feature of the study is its innovative Systematic sensitivity analysis.

The authors estimate that the gains from the DCFTA with the EU stem (in order of importance) from improvements in Trade Facilitation, liberalization of FDI in services and Standards Harmonization. The combination of the three aspects involves a 1.5 percent increase in consumption in the medium term. A scenario limited to tariff liberalization with the EU would be slightly unfavourable for Armenia. The liberalization of FDI in services with the EU produces smaller gains than the ones obtained by the authors for other countries. However, they are four times larger than when the agreements on FDI in services are negotiated only with the CIS countries.

The paper offers a valuable analysis since, in particular, the assessment of the impact of MNEs in services on host economies is a very complex issue, and only a few CGE models have undertaken it. Therefore, these results should be much welcomed.

We think the authors should include some results reflecting the Dixit-Stiglitz-Ethier mechanism. The abstract, introduction and conclusions explicitly mention that an agreement with the EU limited to preferential tariff liberalization in goods will lead to small losses to Armenia primarily due to a loss of productivity from lost varieties from ROW. This assertion could be reinforced by showing the results, in terms of changes in the number of varieties, that reflect it. Moreover the idea of productivity gains, often explained as, obtaining a quality adjusted unit of services at a reduced price when there are more varieties, would be more powerful if the results indeed showed the outcomes on the reduction in prices. We wonder if the authors have results in this line, or if this is not applicable to their case.

In our view, research in this area faces several challenges. First, there are technological characteristics of firms, such as, their costs' structures that, hopefully, in the future will be better grasped by this type of models. As mentioned earlier, the present model has an interesting Dixit-Stiglitz-Ethier mechanism. Further, it includes an extra imported primary factor in the technology of MNEs, which is absent in domestic firms, thus leading to a technological differentiation between both types of firms. However, the simplifying assumption of equal fixed and marginal costs across the different business services and goods sectors seems rather imperfect. Moving ahead to a heterogeneous firms approach in CGEs (e.g., Balistreri et al., 2011; Balistreri and Rutherford, 2011), which also considers monopolistic competition, as this model

does, seems very attractive. Although one can grasp the difficulty of attaining such target by realizing that the CGE model we have just quoted does not include MNEs in it.

Second, maybe the crucial role of the level of FDI barriers for results could be improved by including also a framework with more emphasis on the importance of MNEs and their characteristics versus domestic firms. Much progress has been made in estimating FDI barriers. However, to measure the impact of MNEs, it seems logical to consider their technological characteristics (increasing returns to scale that result in rationalization gains¹, higher capital intensity, size and export propensity ...etc.) compared to national firms and their weight across sectors (shares in value added, production ...etc)². All these pieces of information should lead to more tuned estimations of the interplay between national firms and MNEs.

Finally, would the introduction of unemployment lead to very different results (quantitatively and qualitatively) from levels and FDI trade? Is there a role for this type of extensions to the model? Again, to the best of our knowledge, no CGE model with MNEs has considered unemployment.

REFERENCES

Balistreri, Edward J., Russell H. Hillberry, and Thomas F. Rutherford (2011) "Structural Estimation and Solution of International Trade Models with Heterogeneous Firms", *Journal of International Economics*, 83(2), pp. 95-108.

Balistreri, Edward J., and Thomas F. Rutherford (2011) "Computing General Equilibrium Theories of Monopolistic Competition and Heterogeneous Firms", in *Handbook of Computable General Equilibrium Modeling*, ed. Peter B. Dixon and Dale W. Jorgenson, forthcoming.

¹ Not yet included in any CGE applied to real economies, to the best of our knowledge, apart from the model of Balistreri et al. (2011) just quoted.

² The authors make an important effort to obtain "market shares", but shares of MNEs in other microeconomic variables are also relevant.