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Do Regional Trade Pacts Benefit the Poor? An Illustration from Dominican Republic—Central American Free Trade Agreement in Nicaragua

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Summary. — This paper provides an *ex-ante* assessment of the poverty and income distribution impacts of the Central American Free Trade Area agreement on Nicaragua. A general equilibrium macro model is used to simulate trade reform scenarios and estimate their price effects, while a micro module maps these price changes into real income changes at the individual household level. The final impact on poverty is not too large, but its dispersion across households is significant and should be considered when designing compensatory policies. A main policy message is that Nicaragua should consider enlarging its own liberalization to countries other than the United States to boost trade-induced poverty reductions.

Key words — Central America, Nicaragua, trade, poverty, micro-simulation

1. INTRODUCTION

The debate on the Dominican Republic—Central American Free Trade Agreement (DR-CAFTA) [1] between the United States, five Central American countries (Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua), and the Dominican Republic has been heated by the usual arguments surrounding trade deals. A seemingly persuasive argument against CAFTA is that although new jobs in Central America may be generated, this may be done at the expense of American jobs and to the detriment of local workers hired in jobs that do not comply with minimum labor standards. [2] This argument has limited validity because it considers only the static distributional effects of trade integration. Similarly, arguments in favor of CAFTA or other similar trade deals are also often partial for they normally assume that freer trade indisputably favors growth and that growth trickles down to the poor. A careful assessment of whether trade reform can be beneficial to poor people and what can be done (at least in the short to medium term) to correct potential anti-poor effects is needed to settle the debate, but it is also a difficult task.

There are various channels through which trade liberalization affects the poor as discussed in conceptual terms by McCulloch, Winters, and Cirera (2001), Winters, McKay, and McCulloch (2004), although empirical evidence is rather thin, disparate, and piecemeal. In this study, a numerical simulation model—a computable general equilibrium (CGE) model—in conjunction with a non-behavioral micro-simulation module based on household survey data for Nicaragua is used to estimate *ex-ante* the effects of a CAFTA-like trade shock on poverty. Similar modeling frameworks have been applied to assess income distribution and poverty effects of China's accessing the WTO (Ravallion & Chen, 2004), the consequences for poverty in Latin American countries signing free trade areas treaties (Bussolo, Lay, & van der Mensbrugghe, 2006; Ianchovichina, Nicita, & Soloaga, 2001), or to analyze the link between trade reform and poverty in other geographic areas (Hertel, Ivanic, Preckel, & Cranfield, 2004; Nicita, 2006). [3] The CGE model has the advantage of being a counterfactual analysis tool that can generate price effects which are directly and unequivocally linked to a trade reform. [4] The changes in relative factor prices (particularly between labor and capital remunerations, and between skilled and unskilled labor wages) and relative goods prices (such as between food and non-food items) are then linked to the household survey to generate income distribution effects. This methodology does not maintain full consistency between the micro data and the CGE results. By combining the two, however, it maps aggregate results from the CGE to the detailed information available in the household survey and provides a much more nuanced and useful analysis of poverty impact. This approach also allows decomposing the total effect on poverty into growth and redistribution components and, thus, it can show whether the trickle down assumption applies or not.

The findings of this paper suggest that CAFTA may reduce poverty. This pro-poor effect is not large and its dispersion across households is significant due to their heterogeneity of factor endowments, inputs use, commodity production, and consumption preferences. This dispersion and the possibility that specific (low income) households may lose because of CAFTA need to be taken into account in designing compensatory policies.

Our growth and redistribution decomposition analysis shows that, at least in the short to medium run, redistribution

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can be as important as growth. Further, given the already strong (pre-liberalization) import penetration of agricultural commodities coming from the United States and the initial higher tariffs that Nicaragua is granting to its agriculture, CAFTA may entail a liberalization that is not only geographically but also sectorally biased. A CAFTA-like agreement would thus likely trigger an inflow of cheaper agriculture commodities with a potential short-term unfavorable effect on farmers' incomes and rural poverty. A key policy relevant message of this paper is therefore that Nicaragua should consider enlarging its own liberalization to countries other than the United States to avoid these negative effects on distribution and boost trade-induced poverty reductions. Although this message may not be valid for every country, it is consistent with one of the few robust results emerging from the empirical literature on preferential trade agreements between groups of countries, namely that this type of agreements outweighs its costs only if protection against non-member countries is low (Schiff & Winters, 2003).

The paper is structured as follows: Section 2 presents the CGE model, the micro module, and the relevant data. The first part of Section 3 describes the general equilibrium results of the trade policy shocks, and the second part the poverty implications. The final section provides some concluding remarks.

2. MEASURING THE EFFECTS OF TRADE REFORMS ON POVERTY: LINKING A CGE MODEL TO HOUSEHOLD SURVEYS

(a) *The Nicaragua general equilibrium model and its data*

A 2000 Social Accounting Matrix (SAM) of Nicaragua represents the initial benchmark equilibrium for the CGE model. This SAM, which includes 39 sectors, 39 commodities, 3 factors (skilled and unskilled labor and one composite capital), an aggregate household account, and other accounts (government, savings and investment, and the Rest of the World), has been assembled from various sources incorporating data from the 2000 Input–Output Table and the 2001 Living Standards Measurement Survey (LSMS).

The CGE model is based on a standard neoclassical general equilibrium model, that is, a model that combines the standard consumer and producer theories and the Heckscher–Ohlin–Samuelson trade theory with a compatible data set for a specific country; [5] the following subsections describe its main features.

(i) *Production*

Output results from nested CES (constant elasticity of substitution) functions that, at the top level, combine intermediate and value added aggregates. At the second level, the intermediate aggregates are obtained by combining all products in fixed proportions (Leontief structure), and the value added results are obtained by aggregating the primary factors.

(ii) *Income distribution and absorption*

Labor income and capital revenues are allocated to households according to a fixed coefficient distribution matrix derived from the original SAM. One of the main advantages of using the micro module is to enrich this rather crude macro distribution mechanism. Private consumption demand is obtained through maximization of household-specific utility function following the linear expenditure system (LES). Household utility is a function of consumption of different goods. Once their total value is determined, government and investment demands [6] are disaggregated into sectoral demands according to fixed coefficient functions.

(iii) *International trade*

The model assumes imperfect substitution among goods originating in different geographical areas. [7] Import demand results from a CES aggregation function of domestic and imported goods. Export supply is symmetrically modeled as a Constant Elasticity of Transformation (CET) function. Producers allocate their output to domestic or foreign markets according to relative prices. Under the small country assumption, Nicaragua is unable to influence world prices and its imports and exports prices are treated as exogenous. Assumptions of imperfect substitution and imperfect transformability grant a certain degree of autonomy of domestic prices with respect to foreign prices and prevent the model from generating corner solutions. The balance of payments equilibrium is determined by the equality of foreign savings (which are exogenous) to the value of the current account. With fixed world prices and capital inflows, all adjustments are accommodated by changes in the real exchange rate.

(iv) *Factor markets*

The labor market specification is a key element of the model and an important driver of poverty and distributional results. Labor is divided into two categories: skilled and unskilled. These categories are considered imperfectly substitutable inputs in the production process. Moreover, some degree of market segmentation is assumed: composite capital is sector specific, and labor markets are segmented between agriculture and non-agriculture. Labor is assumed to be fully mobile within each of the two broad sectors, but fully immobile across them. [8] These restrictive conditions are imposed on the modeling framework so that it mimics in a simple and transparent way the short-term impact of trade reforms on the Nicaraguan economy. Finally, the version of the model with segmented labor markets also facilitates linking the macro results of the CGE model to the household survey micro-model, where households are not allowed to respond to price changes by migrating or increasing their human capital endowments (or even changing their consumption choices).

(b) *The micro module: linking household surveys to the CGE model*

Poverty effects of trade reforms are estimated using a top-down approach. Initially, the CGE model calculates the new equilibrium (i.e., new relative prices and quantities for factors and commodities) following a trade shock. Then prices are transferred to the micro module to estimate a new income distribution and poverty effects. No feedback from the micro module to the macro model is explicitly accounted for in this version.

The household survey used for the micro module computations is the LSMS 2001 for Nicaragua. At the individual level, the active employed population aged more than 12 years is classified into skilled and unskilled according to their education level. The employed population is also classified into wage-workers and self-employed. For wage-workers, the entire factor-related income is either unskilled or skilled labor income. As for self-employed workers, their income is assumed to have both a labor and a capital component. To separate these two components, a wage for the self-employed is imputed based on a simple Mincerian wage equation that is estimated for the wage-workers separately for rural and urban areas. The difference between the reported income from self-