

GTAP Board Report
International Food Policy Research Institute
July 2012 – June 2013

Most of the GTAP-related work carried out at IFPRI has been done at MTID (Markets, Trade and Institutions Division)-Globalizations and Markets Research Program (GRP2).

The globalization and markets research program (GRP2) is designed to help national policy makers, researchers, international organizations and agriculture-sector stakeholders in developing and developed countries to better evaluate the implications of different scenarios of trade liberalization and globalization. It is also designed to help decision makers develop adequate related policies and societal responses for rural development, poverty alleviation, and food security, including alleviation of the economic barriers that prevent farmers in developing countries from benefiting from greater market-based opportunities. Policy changes supported by this research are expected to accelerate income growth through increased access to both domestic markets and international trade.

The research under this program emphasizes global agricultural trade negotiations, linkages between domestic policies and globalization, the impact of developed-country policies on developing-country food security, and pro-poor policies along the entire food chain, given the growing importance of consumers and retail industries as food system drivers.

The globalization and markets team is currently composed of: Antoine Bouet, Lauren Deason, Eugenio Diaz-Bonilla, Betina Dimaranan, Kathryn Pace Kincheloe, David Laborde, Sam Morley, David Orden, Shahidur Rashid, Devesh Roy, Marcelle Thomas, Simla Tokgoz, and Fousseini Traore.

Selected Trade-Related Projects in 2012-2013

The work carried out in IFPRI's MTID-GRP2 that employs GTAP database addresses several broad themes: impact of trade liberalization on poverty, export taxation, trade integration, gender, and construction of SAMs.

1. *Impact of trade liberalization on poverty*

There is currently one project (two working papers) in progress from the GRP2 team introducing household data to the MIRAGE model:

- The objective of the study is to develop a version of the MIRAGE model with household heterogeneity and a public agent, to better analyze the impact of trade liberalization and other trade reforms on real income and welfare at the household level. This new version better captures the behavior of the public agent in terms of revenues collected and in terms of expenditures. It also disaggregates the representative household into up to 13-39 households in five developing countries (Brazil, Pakistan, Tanzania, Uruguay and Vietnam). The sources of income and consumption structure reflect disaggregated statistical information coming from households' surveys. Since domestic remittances may constitute an important determinant of income redistribution, the new version also endogenizes private inter-households transfers. This new version of MIRAGE takes into account the reaction of households to these shocks in an integrated and consistent framework. We study the impact of full trade liberalization on these households. This study concludes that: (i) while the impact of full trade liberalization may be small at the macroeconomic level, the effect on households' real income may be quite substantial at the household level with a great heterogeneity; (ii) the

major channel of heterogeneity of the impact of trade liberalization on households' real income is productive factors' remuneration while the impact of consumption prices of commodities is limited; (iii) various domestic policies simultaneously implemented to trade liberalization like modification of public transfers to households or changes in income taxation may significantly change the picture and offer compensation for negative effects of this shock or amplify direct impact of full trade liberalization; (iv) the impact of trade reform on poverty and inequality is significant and diverse from one country to the other.

2. *Export taxation*

Two studies have published in the last year from the GRP2 team with a focus on export taxation and its effects, one focused on a global assessment and another on food crisis:

- The first study is a global assessment of the economic effects related to export taxes. This paper uses a new detailed global data set on export taxes at the HS6 level and the MIRAGE global Computable General Equilibrium model to assess the impact of export taxes on the world economy. We find that removing export taxes would have worldwide effects: the average export tax on global merchandise trade was 0.48 per cent in 2007, with the bulk of these taxes imposed on energy products. The removal of these taxes would increase global welfare by 0.23 per cent, a larger figure than expected gains from the Doha Round. Both developed and emerging economies, such as China and India, would gain from such policies even if they currently impose export taxes. Medium and small food-importing countries without market power (such as the least-developed countries) would also benefit from the elimination of export restrictions – especially during food crisis situations. Both the energy sector and the export taxes implemented by the Commonwealth of Independent States countries appear to play a critical role in the overall economic impact of such a policy change. However, the fact that some countries, such as Argentina, would experience income losses due to such a policy change is a major challenge to overall positive reform in this area. This study was recently published in *The World Economy*.
- The second study focuses on the impacts of export taxation in the context of a food crisis. First, we summarize the effects of export taxes using both partial and general equilibrium theoretical models. When large countries aim to maintain constant domestic food prices, in the event of an increase in world agricultural prices, the optimal response is to decrease import tariffs in net food-importing countries and to increase export tariffs in net food-exporting countries. The latter decision improves national welfare, while the former reduces national welfare: this is the price that must be paid to keep domestic food prices constant. Small net food-importing countries are harmed by both decisions, while small net food-exporting countries gain from both. Second, we illustrate the costs of a lack of regulation and cooperation surrounding such policies in a time of crisis using a global computable general equilibrium (CGE) model, mimicking the mechanisms that appeared during the recent food price surge (2006–2008). This model illustrates the interdependence of trade policies, as well as how a process of retaliation and counter-retaliation (increased export taxes in large net food-exporting countries and reduced import tariffs in large net food-importing countries) can contribute to successive augmentations of world agricultural prices and harm small net food-importing countries. We conclude with a call for international regulation, in particular because small net food-importing countries may be substantially harmed by those policies that amplify the already negative impact of a food crisis. This study was published in the *Review of World Economics* in 2012.

3. Trade integration

GRP2 has worked on two projects in the past year focusing on trade integration and market access:

- The first project is focused on Moroccan trade integration quantifies the effects on income and welfare of Morocco's recent trade integration policies using the MIRAGE model. In particular, the model simulates the preferential schedules of tariffs now faced and proposed by Morocco under the country's recent FTAs with the US and Turkey that entered into force in 2006, as well as the detailed provisions of the EU-Morocco trade deal concerning agriculture and agricultural products, and fishery and fishery products, that was expected to enter into force in mid-2012. This paper is forthcoming as an IFPRI Discussion Paper.
- The second project focuses on market access for poor countries. It examines the potential benefits and costs of providing duty-free-quota-free market access to the least developed countries and the effects of extending eligibility to other poor countries. Using the MIRAGE computable general equilibrium model, it assesses the impact of scenario involving different levels of product coverage, recipient countries, and preference-giving countries. The main goal of this paper is to highlight the role that rich and emerging countries could play in helping poor countries, to assess the costs and benefits for developing countries and whether the potential costs for domestic producers are in line with political feasibility in preference-giving countries. This paper was published in the *Journal of Globalization and Development* in 2012.

4. Impact of trade liberalization on gender

The GRP2 group is continuing its research on the implications of trade liberalization on gender, particularly in the labor sector. There are two dimensions to the project model integration and data:

- Evidence from CGE modeling done on specific countries has shown mixed results as to whether trade liberalization is beneficial or not for women. The impacts of trade reform on employment of men and women depend on many factors including sectorial gender intensities, resource endowments, labor markets institutions, and the modalities of the trade reforms. Different country models that employ different modeling assumptions hinder the comparison of the results of these studies across countries. In our preliminary modeling strategy, gender is introduced into a global CGE model and database through skilled and unskilled gendered labor splits to allow for the assessment and cross-country comparison of the impacts of global and regional trade reforms.
- The data portion is built on work done by Tsigas and Weingarden (2010) in generating employment shares across five occupational levels for use in updating the skilled and unskilled labor splits in the GTAP database, we use employment and wages data across occupations and industries, differentiated by gender, from the International Labor Organization (ILO). Statistical methods will be employed to extend the coverage of the gendered labor data from 40 countries to the full GTAP set of regions.

5. Construction of SAMs

African countries are hitherto underrepresented in the GTAP database. Yet, the GTAP project is attaching high priority to improving its coverage of Africa as evidenced by the list of the top most wanted countries. A partnership is therefore agreed between AGRODEP and GTAP and is aimed at filling this gap. By the virtue of one of its mandate falling under the data component, AGRODEP since its inception is gearing up towards being at the forefront of the data warehousing in Africa. Contributing to this goal, AGRODEP makes available existing national social accounting matrixes (SAMs) for African countries that have been stored in the IFPRI website. Besides existing data sources, AGRODEP also tries to demean as much as possible the data gap and complements by

building new national SAMs. It also tries to put together national SAMs from diverse sources including national statistical offices through its members. Prior to housing these databases in its website and making them publicly available, all the data go through a thorough quality checking process.

So far, AGRODEP has contributed three national SAMs to the GTAP database including Burkina Faso, Togo and Guinea. All the three countries are part of the regional group of the Economic Community of the West Africa states (ECOWAS) not hitherto separated in the GTAP dataset. Breaking down the ECOWAS countries that have been so far grouped in the global database enhances the ability to estimate the effects of trade policy reforms on individual countries.

Burkina Faso's IO table builds upon a 2005 agricultural-focused SAM developed by officials of the Ministry of Agriculture, of Hydraulic and of Fishery Resources and other government officials. The detailed structure of the SAM includes 132 accounts of goods and services; and 74 accounts of activities. The factor account consists of 3 categories of agricultural workers and 2 types of capital distinguishing between agricultural and non-agricultural capital. The accounts for the institutional units distinguish between 4 representative categories of households, 1 Government account, 2 accounts of financial and non-financial corporations, and 1 account of non-resident institutions or rest of the world (ROW). The sectors of the SAM include 20 cropping and 6 livestock products sectors beside fishery and forestry; 1 mining sector; 28 manufacturing sectors and 20 services. The detailed nature of the SAM's sectors facilitated the mapping to the GTAP sectors which gives rise to 38 mapped sectors without further aggregation.

The Togo IO table contributed to the GTAP database relies on a 2000 SAM built by the Partnership for Economic Policy (PEP) network researchers. It includes 40 sectors, of which 5 agricultural sectors; 19 manufacturing and 13 services. The sectors of Togo's SAM are relatively aggregated unlike the Burkina Faso one which is subsequently reflected in the mapping to the GTAP sectors. Indeed, the mapping entails a final IO table with 30 sectors with further aggregations made on the agricultural sector.

The 2005 Guinea SAM has been built by IFPRI staff. Initially, the level of the sectoral disaggregation of the SAM (31 sectors) did not fit the GTAP data contribution requirements. Therefore, the initial SAM has gone through a further disaggregation process. Basically, the mining sector and the information available on this sector have been put into contribution to disaggregate the SAM's sectors and therefore end up with 43 sectors prior to the mapping. The 43 sectors include 26 agricultural sectors and 10 mining sectors. The mapping to the 57 GTAP sectors results in a final IO table with 30 sectors.

A series of GEMPACK and MS-DOS programs was used to convert the original data for each country to the required GTAP format. Each dataset was processed by a program specific to that country.

IFPRI and AGRODEP contributions to GTAP 2012-2013

Two new IO tables for two African countries, Burkina Faso and Togo have been contributed by Lacina Balma through collaboration between AGRODEP and GTAP. Ismael Fofana has provided an IO table for Guinea which has been processed by Lacina Balma, bring up the AGRODEP contribution to three new African countries singled out in the GTAP 8.1 database.

GTAP- and trade-related publications

ARTICLES IN PEER-REVIEWED JOURNALS & CHAPTERS IN COLLECTIVE BOOKS

Bouet, A., C. Estrades and D. Laborde, 2013, A Global Assessment of the Economic Effects of Export Taxes, *The World Economy*, doi: 10.1111/twec.12072.

Bouet, A., E. Dienesch, K. Elliott and D. Laborde, 2012, The Costs and Benefits of Duty-Free, Quota-Free Market Access for Poor Countries: Who and What Matters, *Journal of Globalization and Development*, 2012(1).

Bouet, A., and D. Laborde, 2012, Food Crisis and Export Taxation: the Cost of Non-Cooperative Trade Policies, *Review of World Economics*, 148(1): 209-233.

IFPRI AND OTHER DISCUSSION PAPERS

Bouet, A., D. Laborde, M. Thomas, 2013. Evaluating Morocco's recent trade integration policies: A CGE Application IFPRI Discussion paper, forthcoming.

Bouet, A., C. Estrades and D. Laborde, 2013. Households heterogeneity in a global CGE model: an illustration with the MIRAGE-HH (MIRAGE-HouseHolds) model, IFPRI Discussion Paper, forthcoming.

Bouet, A., C. Estrades and D. Laborde, 2012. Households heterogeneity in a global CGE model: an illustration with the MIRAGE-HH (MIRAGE-HouseHolds) model, LAREFI Working Papers, University of Montesquieu Bordeaux IV.