DECPG (Development Prospects Group)

Staff announcement:

We are very pleased to announce that DEPG has hired Csilla Lakatos in March, 2015 greatly expanding our modeling capacity. Csilla has joined us from DG Trade, European Commission. She is applying LINKAGE, DECPG's in-house general equilibrium model to study the economic and poverty impacts of a changing China on Africa and is contributing to various projects on TPP, demographic change, model updates etc.

GTAP data was used to calibrate LINKAGE in various analysis conducted by DECPG:

International Migration and Development: A Global Dynamic General Equilibrium Analysis

This is a policy research working paper coming out of a DECPG-administered KCP II project - "Revisiting the Gains from International Migration". It is examining the development impact of greater migration and lower remittance costs using an updated version of the LINKAGE model that was extended to model bilateral migration and remittance flows. The model has been updated and is using the GTAP Database V8.1 as well as the GMig2 bilateral migration database that is consistent with GTAP V8.1. This paper is being presented at the Annual Conference on Global Economic Analysis 2015 in Melbourne by Dirk Willenbockel, the lead author.

The Implications of HIV/AIDS for Demographics, Growth, and Poverty in Southern Africa

This is a background paper commissioned from DECPG by the World Bank's Social Protection Global Practice for a report on the impact of HIV/AIDS on age structure in Botswana, Lesotho, Namibia, South Africa, and Swaziland, to be completed in August 2015. This paper is also being used as the thematic section of the South Africa Economic Update 2015 July bi-annual report. This background paper is using the LINKAGE and GIDD models to examine a) how changing age structures in the region are contributing to growth and poverty reduction in the focus countries; b) how the HIV/AIDS pandemic affected growth via changes in age structure; and c) how labor market interventions could be used to accelerate growth and poverty reduction in the region. The database used in the LINKAGE side of the analysis is the GTAP Database V8.1.

The Economic Impact of the 2014 Ebola Epidemic: Short and Medium Term Estimates for West Africa. World Bank. 2014, Washington, DC: World Bank.

The Economic Impact of Ebola on Sub-Saharan Africa: Updated Estimates for 2015.

David Evans, Francisco Ferreira, Hans Lofgren, Maryla Maliszewska, Mead Over, Marcio Vargas Da Cruz,│ Jan 2015 Washington, DC: World Bank.
The October 2014 report presented the World Bank's preliminary estimates of the economic impact of the Ebola outbreak in West Africa for 2014 and 2015. Using limited and uncertain initial data, the team

estimated the potential magnitude and characteristics of the economic impact of a rapidly spreading disease outbreak. In the report the authors input World Bank staff estimates of the impact of Ebola on Liberia's macroeconomic growth into the Liberia version of MAMS, a computable general equilibrium (CGE) model, to extract a set of shocks that would deliver that overall observed impact and provide additional indicators of the impact of Ebola on Liberia (e.g., household consumption and poverty). Then those shocks were scaled using published epidemiological distributions of the possible pattern of international transmission of Ebola and applied to other countries to project the economic impact of Ebola across the continent under high-spread and low-spread scenarios using the global CGE model LINKAGE. This document represented the first effort to estimate the regional economic impacts and formed an integral part of the Bank's strategy to fight Ebola. It drew lots of attention to the potential impacts of the epidemic and therefore likely garnered additional international support.

Global Monitoring Report 2015

DECPG is contributing Linkage-based analysis using GTAP data to the Word Bank Flagship focusing on MDGs, SDGs and the Twin Goals – Global Monitoring Report. This year the thematic focus of the report is on demography. The CGE analysis is being applied to study the impacts of demographic change on global growth and poverty reduction, focusing on international channels such as trade, migration and capital flows.

DECRG (Development Research Group)

Over the past year, Will Martin (previously DECRG, now IFPRI) worked a great deal on the implications of food price volatility for welfare. Key results were presented at a World Bank conference on that topic in September 2014 (http://www.worldbank.org/en/events/2014/07/21/food-price-volatility-food-security-and-trade-policy-conference-2014)

Some selected publications on the topic

Laborde, D. and Martin, W. (2015), 'Formulas for failure? Were the Doha tariff formulas too ambitious for success? World Trade Review 14(1): 46-65.

Ivanic, M. and Martin, W. (2014), 'Implications of Domestic Price Insulation for Global Food Price Volatility' Journal of International Money and Finance 42:272-88.

Ivanic, M. and Martin, W.(2014) 'Poverty Impacts of the Volume-Based Special Safeguard Mechanism' Australian Journal of Agricultural and Resource Economics 58(4):607-21.

Ivanic, M. and Martin, W. (2015) 'The welfare impacts of changes in food prices' in Gillson, I and Fouad, A. eds Trade Policy and Food Security: Improving Access to Food in Developing Countries in the Wake of High Prices, World Bank, Washington DC.

Ivanic, M. and Martin, W. (2014), 'Rice price shocks: impacts on the poor' in Dawe, D., Jaffee, S. and Santos, N. eds Rice in the shadow of Skyscrapers: Policy Choices in a Dynamic East and Southeast Asian Setting, FAO, World Bank and IRRI, Rome.

Alston, J., Martin, W. and Pardey, P. (2014), 'Agricultural R&D policy and long-run food Security' in Balisacan, A., Uijayant Chakravorty, U. and Ravago, M. eds Economics of Sustainable Development, Risk, Resources and Governance, Elsevier.

Alston, J., Martin, W. and Pardey, P. (2014), 'Influences of agricultural technology on the size and importance of food price variability' in Chavas, J-P, Hummels, D. and Wright, B. eds. The Economics of Food Price Volatility, University of Chicago Press for NBER.

Fukase, E and Martin, W. (2015) Economic implications of a potential free trade agreement between India and the United States. Policy Research working paper 7212., World Bank, Washington, D.C.

MNACE (Middle East North Africa Chief Economist Office)

Economic Effects of the Syrian War and the Spread of the Islamic State on the Levant Elena

Ianchovichina and Maros Ivanic

This paper uses the GTAP model and a modified GTAP 8 database with new detail on six Levant countries - the Arab Republic of Egypt, Iraq, Jordan, Lebanon, the Syrian Arab Republic, and Turkey -- to quantify the direct and indirect economic effects of the Syrian war and the advance of the Islamic State on the Levant. The paper was extensively cited in the press (e.g. Financial Times, Wall Street Journal, Reuters, Al Jazeera among other news outlets in the regions (e.g. Zawya, Daily News Egypt, Shorouk News "Reuters") and was presented in Iraq. The paper provided background material for MNA quick note 140, an interview as part of the MNA conversation series, and a blog which became a top World Bank Facebook post and was reprinted in Al Jazeera online. The paper was accepted for presentation at the upcoming GTAP conference in Melbourne.

GENDR (Environment and Natural Resources Global Practice)

Institutional, Economic, and Poverty Aspects of Georgia's Road to Environmental Sustainability

World Bank Report No: 94211-GE

The GTAP-CGE model was, first, used to develop a Business as Usual (BAU) scenario where no additional measures on pollution control or disaster risk management are implemented. Second, the CGE model was used to estimate the GDP impact of environmental degradation and environment-related disasters. The comparison between the Business as Usual Scenario and the simulations reflecting COED-adjusted GDP estimates the environmental cost on economic growth on the way forward. As a pathway of transition to "inclusive green growth," various interventions are modeled. Finally, the benefits/costs for each actionable recommendation from the inclusive green growth matrix are introduced into the CGE framework, and its net benefits are quantified by comparing the results to those in the BAU. The "inclusive green growth" scenarios used in this analysis aim to inform Georgian decision makers about priorities for their interventions and investments for sustainable and inclusive growth.

Agricultural Policies and Trade Paths in Turkey

Donald F. Larson, Will Martin, Sebnem Sahin, Marinos Tsigas

This essay traces the influences the Turkey-European Union economic institutions have had on agricultural policies and the agriculture sector. An applied general equilibrium framework is used to provide estimates of what including agriculture under the Customs Union would mean for the sector and the economy. The paper also discusses the implications of fully aligning Turkey's agricultural policies with the European Union's Common Agricultural Policy, as would be required under full membership.

Economic Contribution of the Fisheries Sector in Sri Lanka: Short Term and Long Term Perspectives

Sebnem Sahin, Tolga Cebeci, William Lane

A recent EU ban on Sri Lankan fish exports will impact growth and poverty reduction. In February 2015, the EU imposed a ban on fish imports from Sri Lanka over concerns about Illegal, Unreported, Unregulated (IUU) fishing. The European Union is the main destination of fish exports of Sri Lanka with about 42 percent of fish exports being shipped to the EU in 2013. The fisheries sector employs an estimated one million citizens in both formal and informal jobs, contributing over 1.8 percent of GDP in 2014. Most of the population involved in this sector is located in the Northern and Eastern Provinces. The direct impact of the ban could mean a loss of hundred million dollars in annual trade and hundreds of thousands of jobs. Recent analysis using a Computable General Equilibrium model found that the EU ban could also cause a 2.3 percent contraction in fish production and lead to excess supply of fish for the domestic market. The resulting estimated 5 percent decline in fish prices would lead to a 0.4 percent decline in real wages for labor employed in fisheries, while 3.4 percent of the workers would likely move towards other sectors. The overall effect of the ban on Sri Lankan fish could cause a decline in Sri Lanka's GDP growth rate by 0.01 percentage points and a 3 percent increase in poverty from 6.74 to 6.94 percent. Although the ban is on the fishing sector, unskilled workers in agriculture and other sectors are likely to be the most adversely affected due to inter-sectoral linkages and because of increased competition with workers who lose their fishing jobs.

Reforming Electricity Subsidies in Pakistan: Measures to Protect the Poor

Thomas Walker, Sebnem Sahin, Mohammad Saqib and Kristy Mayer

As part of its energy sector reforms, the Government of Pakistan plans to reduce spending on electricity subsidies to 0.3-0.4 percent of GDP by mid-2016. The reforms will alleviate a major constraint on the government's budget. However, they will necessitate increases in the price of electricity, which have the potential to measurably reduce the welfare of the poor. The government will need to carefully design the price increases and provide associated compensation to avoid this outcome. This paper demonstrates that that it is possible for the government to protect the poor against most of the costs of the reform while at the same time improving the targeting of remaining subsidy expenditures. Measures that can be taken include targeting subsidies based on poverty scores and providing targeted cash compensation to poor households. We illustrate how these measures could be implemented, and estimate their associated welfare impacts.

Agricultural production, irrigation, climate change, and water scarcity in India

Farzad Taheripour, Thomas W. Hertel, Badri Narayanan Gopalakrishnan, Sebnem Sahin, and Jorge J. Escurra

This paper uses an advanced Computable General Equilibrium (CGE) model coupled with biophysical data on future changes in crop yields due to climate change to examine: 1) the consequences of climate change for India's agricultural and food products; 2) the extent to which water scarcity can affect the irrigation adoption and demand for water; and 3) how water scarcity, climate change, and trade jointly alter land use changes across the Indian subcontinent. It shows when water scarcity is ignored, irrigated areas grows due to changes in crop yields induced by climate change. When water scarcity is introduced, competition for water increases and that largely reduces demand for irrigation across all river basins in India. When available water for irrigation is not limited, climate change alone could moderately increase agricultural outputs at national level and that leads to some welfare gains. However, water scarcity, induced by expansion in water demand in non-agricultural uses and lack of water infrastructure, blocks the demand for irrigation and that generates significant negative impacts on the economy of India and its agricultural activates. The overall welfare losses due to water scarcity for this economy is expected to be about $3.2 billion (at 2007 prices) in 2030. With a 3% discount rate, the net present value of the annual reductions in welfare will be about $24.3 billion for 2008 to 2030.

Water Scarcity in South Asia: A Dynamic Computable General Equilibrium Analysis

Badri Narayanan G., Farzad Taheripour, Thomas W. Hertel, Sebnem Sahin, and Jorge J. Escurra

The economy of South Asia faces serious challenges in water availability, which are expected to aggravate over the coming decades. In this context, we assess the long-run economy-wide impact of potential water scarcity in South Asia within a global context. This paper uses a dynamic Computable General Equilibrium (CGE) model, in tandem with an advanced comparative static CGE model, to examine the differences in economic growth possibilities in South Asia with and without water scarcity. Alternative assumptions on substitution between water and other inputs are considered. Our analysis shows that water scarcity is likely to affect economic growth of entire South Asian region adversely, more so in the future years. The potential losses for not pursuing productivity improvements in water use are huge, ranging from 7% to 45% of the potential GDP in 2030. Further looking at the sectoral impacts, we also find that water scarcity generates larger price impacts, particularly in the food sectors, in the medium term.

GFADR (Agriculture Global Practice)

We have used GTAP data in the Agriculture GP to construct input-output tables to better understand the role of agriculture and agribusiness at the national level. Although we are well aware this is not the primary objective of this data base, there is currently no methodology to obtain this information, and the analysis we have done thanks to GTAP data, has given us some important insights. We created input-output tables for 130 economies using data from 2011.

GMFDR (Finance and Markets Global Practice)

El Salvador

The SAM extracted from GTAP allowed us to conduct two sets of analyses on El Salvador: i) to assess the impact of policy changes (in terms of public spending reallocation) and external shocks (increase in remittances), recommended in the SCD, on growth in shared prosperity; the second consisted to analysis the impact of VAT change and energy subsidies reforms on poverty and inequality relying on a sequential microsimulation combining a single country CGE (using GTAP data base and simulation platform), and a micro module (using Labor and expenditures survey).

Caribbean

The Impact of Easing the US embargo of Cuba on Tourism in the OECS: This work conducted as a thematic chapter of MFM Bi-annual Update prepared for Spring Meetings, aimed to measure the potential impact of the easing of US embargo on Cuba on the tourism sector of the OECS countries. The analysis was conducted in two steps: the first step, relying on a gravity model, estimates the level of restrictiveness caused by the US embargo on Cuban tourism performances; and the second step simulates, through a global Computable General Equilibrium model (CGE), using GTAP, the impact of the removal of restrictions on Cuban tourism estimated in the previous step.

Africa

GTAP data was used to look at different manufacturing sub-sectors' imports of different types of services in Ethiopia and peer countries, for a report on assessing the manufacturing-services linkages in Ethiopia.

Other

GTAP data was also used to expand the Francois et al. database (Export of Value Added Database) to measure the import content of exports across countries/sectors. This is still being finalized.

Economic and fiscal effects of the proposed changes in energy taxation on Poland and other EU regions through 2030

Center for Climate Policy Analysis

As part of its efforts to tackle climate change, in early 2012 the European Commission proposed changes in the taxation of energy use in sectors whose emissions are not regulated through the EU emissions trading system (ETS). They are usually referred to as the non-ETS sectors and cover emissions mainly from transport, agriculture, services, light industry, and households. The proposed new minimum levels of excise energy taxes were to be phased in gradually between 2016 and late 2020s, and were aimed at improving the consistency of tax treatment of energy source, eliminating double taxation, and aligning taxation of renewables. Because EU countries vary in their energy mix, and Poland derives a significant share of final energy from coal, it was expected that the proposed increased excise on coal might create a substantial burden for non-ETS sectors in Poland. Also, the excise rate on oil products was to increase in Poland more significantly than the EU average. The analysis of energy taxation reform is based on the PLACE model, a multi-sector, computable general equilibrium model multi-region, multi-sector CGE model

PLACE, based on GTAP8.1 global input-output tables, with most of the EU countries represented individually.

Sharing the burden of the EU climate and energy policy 2030: an economic impact assessment for the EU Member States.

Center for Climate Policy Analysis

The European Commission's Impact Assessment of the 2030 climate and energy policy framework of January 2014 was based on the principle of cost-effectiveness. Almost immediately, policy discussions were supplemented with equity or solidarity considerations. This report discusses economic effects of 'extreme' scenarios which follow the principles of cost-effectiveness or equity and a potential trade-off between them. The main message is that economic efficiency can be a servant to equity and the lower the overall cost, the easier the resolution of thorny, normative equity issues. There are various criteria which can be applied at the operational level in order to determine an equitable distribution of emission mitigation costs among EU countries for 2030. These criteria can be separated into ex ante and ex-post. If applying ex ante criteria, then the welfare costs of mitigation are distributed in proportion to historical emissions, to population, or in inversely to GDP per capita. By comparison, cost allocation based on ex-post criteria needs to be based on a model simulation of the welfare impact of climate policy in the future, and the burden-sharing across countries is then driven by the normative choice of the social welfare function, including assumptions on the degree of inequality aversion, focusing on the well-being of the poorest countries. The economic impacts of alternative burden-sharing scenarios were assessed based on an extended version of the multi-sector global CGE model, PLACE, multi-region, multi-sector CGE model PLACE, based on GTAP8.1 global input-output tables, in which most of the EU countries are represented individually.

Low Oil Prices: Long-Term Economic Effects for the EU and other Global Regions based on the Computable General Equilibrium PLACE Model

Jakub Boratyński and Leszek Kasek

Oil prices on global markets have plunged from US$115 per barrel in mid-June of 2014 to US$48 at end-January 2015, while other fuel prices have continued the slow downward trend of recent years. The rapid decline in oil prices by about 60 percent was accompanied by U.S. dollar appreciation against the major global currencies (except the Swiss franc), partly offsetting the oil price decline measured in currencies other than the dollar. Oil prices that remain low over the long-term would give a positive boost to the global economy, but the effects will vary across countries. While net oil (fossil fuel) importers are expected to win (Europe, Japan, China, India), net oil exporters (OPEC countries, EFTA, Russia, Canada) are set to lose. However, in the EU, with carbon emission constraints in place, the possible benefits for oil users will be restricted because of climate regulations. This paper quantifies the economic effects of lower fossil fuel prices in the 2020 time horizon, modeled as a supply shock, and emphasizes their interaction with EU climate policy. The impact assessment of the oil price shock was conducted using a multi-county, multi-sector computable general equilibrium (CGE) model, PLACE, maintained by the Center for Climate Policy Analysis (CCPA). The model is based on GTAP8.1 database as primary source of information.

GTCDR (Trade and Competitiveness Global Practice)

Valuing Services in Trade – a Toolkit for Competitiveness Diagnostics

Sebastián Sáez, Daria Taglioni, Erik van der Marel, Claire H. Hollweg, Veronika Zavacka

GTAP data is used for analyzing services performance of developing countries. For this purpose, with the support of Joe Francois, the Trade Practice developed a database to measure Export in Value Added. The database uses input-output data from GTAP to construct country-specific measures of the direct and indirect contribution of services to the value added contained in a given country's domestic production and exports. Specifically, the database contains two matrices, a domestic value-added table and an export value-added table, which identify the value-added contribution of particular inputs to sectors that either sell the final good to the domestic market or export it. The cross-country database covers about 100 countries and 27 sectors (nine commercial services sectors, three primary sectors, and 14 manufacturing sectors) spanning intermittent years from 1997 to 2011.

This database is a valuable tool for the analysis of services performance included in the book Valuing Trade in Services (see attached) and have a great impact in the WBG dialogue with its clients, specially, least-developed countries.