The Global Trade Analysis Project: Report, Issues and Future Directions

2012

Compiled by
Terrie Walmsley

With contributions from
Angel Aguiar, Meghan Alexander, Ginger Batta, Uris Baldos, Alla Golub, Thomas Hertel, Csilla Lakatos, Robert McDougall, Badri Narayanan, Jevgenijs Steinbuks, Farzad Taheripour and Wally Tyner

Center for Global Trade Analysis
Purdue University

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PURDUE
U N I V E R S I T Y

June 13, 2012

Dear Board Members,

In March 2012 the Center released the GTAP 8 Data Base to the public, along with several satellite datasets: CO2 emissions, migration, and foreign capital. Over the next year we plan to also release land use and Non-CO2 emissions data to the public. Over the last few months we have been developing a plan for the future development of the GTAP Data Base from version 8.1 to v.9 and beyond. We look forward to your comments on the proposed plan.

Climate change and energy-related research continues to grow in interest amongst advisory board members and the network. Below we outline the current and future research that the Center is undertaking in this area which includes projects in the areas of bio-fuels, new energy technologies, global land use for food and fuel, climate change impacts and climate change mitigation policies.

There are also a number of new research projects commencing in the trade and development areas, including the differentiation of specific tariffs, the documentation of a decomposition tool for analyzing the macroeconomic transmission mechanisms in the GTAP Model, the development of a GTAP Model with heterogeneous firms and the development of a model and tools for analyzing country-specific endowments, disaggregated households and international and intra-national transfer payments.

As you will see in the following document, Center staff members have continued to make progress towards their goals. I hope you enjoy reading what we have done and our thoughts on the year ahead. We look forward to your feedback and to a fruitful discussion of these issues in Geneva.

Yours Sincerely,
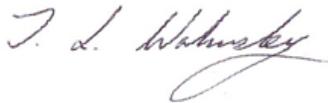
Terrie L. Walmsley
Director, Center for Global Trade Analysis
Purdue University

Executive Summary

Background

- The GTAP 8 Data Base was released in March, 2012. Significant improvements were made in energy data, protection and taxes. Regional coverage expanded to 129 countries, including many new countries in the Middle East and Africa. Improvements have also been made in agricultural domestic support and agricultural production targeting.

- A number of satellite datasets were also released with the GTAP 8 Data Base, including CO_2 emissions, migration and foreign capital flows. We are currently working on releasing land use and non-CO_2 emissions associated with the version 8 data base.

- Continued growth and success in research activities in the area of climate change and land use, with a new initiative underway in modeling water.

- Continued research aimed at improving the GTAP suite of models with the publication of the GDyn model book, documentation of the macro transmissions mechanism in GTAP and specific tariffs, and improvements in modeling of inter-regional and institutional flows.

Challenges for the upcoming year and beyond

- We have developed a plan for GTAP 8.1, 9 and beyond which will be implemented over the next few years. This year the challenges will be:
  a) Finalizing the documentation of version 8.
  b) Incorporating the skills data, developed by Marinos Tsigas from the USITC, into the GTAP 8.1 Data Base.
  c) Make some of the larger changes required for the GTAP 9 Data Base, such as the changes required to the FIT program for adjusting national IO tables.
  d) Releasing the Non-CO_2 emissions dataset.

- Communicating the benefits of GTAP to new and less experienced users is becoming increasingly difficult as the models and datasets become increasingly complex. A big challenge for the Center over the next few years will be to determine ways to make these new datasets and models accessible to a larger share of network members.

- Hiring an additional administrative staff member.

Recommended Strategies

- Badri Narayanan has already begun revising and posting chapters for the database documentation and is interacting closely with authors to get chapters up on the website as quickly as possible.

- Alla Golub and Burcu Irfanoglu have offered to assist with some of the data tasks, including the skills data and the FIT program.

- We have hired Amer Ahmed as a consultant to assist us with the Non-CO_2 emissions by working with Steve Rose.

- We continue to focus on research projects that improve the GTAP data and suite of models. However, we need to find ways to communicate with and educate network members more effectively. This will be an important issue for discussion at the strategic planning process later this year.

- The administrative team is in the process of looking through applications for the new position and will interview candidates when we return from Geneva.

GTAP Advisory Board Members[1] and Others Attendees

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[1] Agency reports are available in the supplementary materials:
http://www.gtap.agecon.purdue.edu/events/Board_Meetings/2012/supp_material.asp.

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SCHEDULE FOR GTAP ADVISORY BOARD MEETING
June 25-26, 2012

International Trade Centre
54-56 rue de Montbrillant
Geneva 1202
Switzerland

Monday, June 25	
9:00am-10:00am	**Informal Coffee for those who arrive early** *Please note that a photo ID (ideally a passport) must be left at security, in exchange for a visitor badge, to enter the ITC.*

10:00am-11:10am	**Welcome and Overview**
	Chair: Thomas Hertel
	
	    • Introductions (20 min)
	      - Thomas Hertel
	
	    • Overview and Issues (20 min)
	      - Terrie Walmsley
	
	    Discussion (30 min)

11:10am-11:30am	**Coffee Break**

11:30am-1:00pm	**The GTAP Data Base**
	Chair: Liwayway Adkins
	
	    • Data Base: Progress and Future Directions (20 min)
	      - Badri Narayanan
	
	    • CO2 Emissions (10 min)
	      - Robert McDougall
	
	    Discussion (20 min)
	
	    • Protection Discussion
	      - Badri Narayanan (10 min)
	      - Comments from Antoine Bouët, Sébastien Jean and Anders Aeroe
	
	    Discussion (30 min)

1:00pm-2:30pm	**Lunch**

2:30pm-4:00pm	**Satellite Data**
	Chair: Martina Brockmeier
	
	• NonCO2 Emissions (10 min)
	  - Steven Rose
	
	• Land Use/GEOSHARE (10 min)
	  - Thomas Hertel
	
	• Global Input-Output Analysis using GTAP data (10 min)
	  - Zhi Wang
	
	Discussion (30 min)

	Research • Africa Project (10mins) - Terrie Walmsley *Discussion (20 min)*
4:00pm-4:30pm	**Coffee Break**

4:30pm-5:00pm	**New Datasets**
	Chair: Terrie Walmsley
	• NTMs (5mins)
	  - Anders Aeroe
	
	• Energy Subsidies (5mins)
	  - Susan Stone
	
	Discussion (20 min)

5:00pm-6:00pm	**Discussion of Data Base and Research Issues** Chair: Terrie Walmsley
7:30pm	**Dinner**

Tuesday, June 26	

9:00am-10:45am	**The Network**
	Chair: Richard Garbaccio
	
	• 2012 Conference Report (10 min)
	  - Patrick Low/Representative
	Discussion (10 min)
	
	• 2013 Conference Report (10 min)
	  - Xingguo Ye and Yihai Li
	Discussion (10 min)
	
	• 2014 Conference Report (10 min)
	  - Betina Dimaranan
	Discussion (10 min)
	
	• Research Fellows Report and committee nominations (15 min)
	  - Sergey Paltsev and Janine Pelikan
	Discussion (30 min)

10:45am-11:15am	**Coffee Break**

11:15am-1:00pm	**Priorities for Forthcoming Year**
	Chair: Thomas Hertel
	
	• Budget and Staffing (20 min)
	  - Terrie Walmsley
	Discussion (20 min)
	
	• Revisit Priorities for Next Year (20 min)
	  - Terrie Walmsley
	Discussion (45 min)

1:00pm-2:30pm	**Lunch**
2:30pm-6:00pm	**Additional Meetings**
	GEOSHARE (if required)
	Conference 2013 Meetings (as required)

Wednesday, June 27	
10:00am-12:30pm	**Additional Meetings if required**
	Protection Data (if required)
1:00pm - 2:30pm	**IRIO Meeting** (VR 1, World Trade Organization)

I.   Mission and Goals

Our Mission

To provide leadership in economic policy analysis through better data, fostering collaboration and research.

We value:

o *International Collaboration* because it increases quality of data and analysis.

o *Objectivity and transparency* because they are crucial to our data work and analysis.

o *Discovery* because improving methodology leads to better policy analysis.

o *Learning* because it creates critical vibrancy both within the Center and in the expanding network.

o *Engagement* because it helps us serve policy analysts and decision makers with better data and analysis.

We believe that:

o Better data leads to better policy analysis which leads to better policy.

o Reconciling data makes data better.

o CGE modeling provides useful insights.

o Avoiding duplication in data production is efficient.

o Collaboration enhances individual efforts.

o Having more trained users enriches policy debates.

Goals 2008-2012

1. *Data Goal***:** To Improve the quality of data products through:

   a. Improving the quality of contributed I-O data

   b. Addition and improvement of other datasets

   c. Monitoring of data quality using comparison programs

   d. Version control and documentation

2. *Research Goal***:** To actively participate in quantitative economic analysis of pressing global concern in the areas of Trade and Development and Global Environmental Issues

3. *Model Goal***:** To promote further development of GTAP-based models

4. *Education Goal***:** To expand and improve global economic analysis education worldwide

5. *Staffing Goal***:** To actively seek and encourage talented staff and graduate students

6. *Collaboration Goal*: Actively seek opportunities for fostering collaboration with institutions around the world

II. Center Staff, Research Associates, Graduate Students and Visitors

Center Staff

Angel Aguiar, Research Economist and Data Base Construction Specialist
Angel is a Data Base Construction Specialist and Research Economist. His responsibilities include the macro datasets and working with the contributors of the regional Input-Output data for the GTAP Data Base. Angel also teaches on GTAP Short Courses and undertakes economic research on global trade and migration.

Meghan Alexander, Senior Program Manager
Meghan manages the pre-proposals, logistics, budgets and implementation of GTAP Short Courses, conferences and the board meeting at home and abroad; liaises with advisory board members and Purdue administration; and oversees the Center's finances.

Ginger Batta, Communications and Information Technology Specialist
Ginger is responsible for the design, development, and maintenance of the GTAP website; the sales, distribution, and reporting of all GTAP products; the content organization and development of the annual conference and participant relations for all GTAP events.

Mary Burfisher, Senior Education Advisor
Mary is new to the Center. She is hosting the GTAP Short Course at George Mason University this summer and will be involved in development of the Center's new education plan.

Alla Golub, Research Economist
Alla works on multiple special projects related to climate change mitigation policy. She is currently working with DOE on dynamic extension of GTAP-E model; with FAO on a project that evaluates the effects of GHG mitigation policies on global livestock production; with EPRI on two separate projects evaluating offsets market potential and dynamic interactions between climate change mitigation and bioenergy policies.

Thomas Hertel, Executive Director and Distinguished Professor
Thomas's focus is on strategic issues and new research directions for the Center, as well as Consortium development. He also supervises graduate students and is heavily involved in a number of environment-related projects at the Center.

Csilla Lakatos, Research Associate
Csilla is a Research Associate at the Center and works with the USITC to develop capacity for the modeling of foreign direct investment and the activities of multinational companies in a computable general equilibrium setting.

Robert McDougall, Deputy Director
Robert works on special projects which significantly improve the GTAP Data Base and Models. This year he has been working on energy data, energy modeling, and the development of programs to compare databases and ensure data base quality.

Badri Narayanan, Data Base Manager and Research Economist
Badri is in charge of the management and construction of GTAP Data Base releases and documentation. This year, Badri has been working on the construction of the GTAP 8 Data Base. Badri is also conducting

research on a range of issues, including child labor and tariff escalation. He teaches in the GTAP short courses as well.

Jevgenijs Steinbuks, Post-Doctoral Research Associate

Jevgenijs is currently funded under an NSF grant through the University of Chicago. He is examining issues of long run competition for land in the face of uncertainty. He has also taken the lead on the processing of IEA Energy data and he has been collecting input for a restructuring of the GTAP energy module.

Wallace Tyner, Senior Policy Advisor and Professor

Wally advises the Center on policy. Most recently he has been spearheading a number of large research projects and proposals in the areas of energy, climate change, and biofuels.

Nelson Villoria, Research Assistant Professor

Nelson is part of the Center's management committee, coordinates the GTAP Short Courses held in the U.S., supervises graduate students, and conducts research on aggregate land supply and international trade.

Terrie Walmsley, Director and Research Associate Professor

Terrie oversees the day-to-day activities of the Center, as well as focusing on new initiatives in development of the GTAP Data Base and the Center's educational activities. Terrie also supervises graduate students and undertakes research on trade, development and migration.

Research Associates

Roman Keeney, Faculty Research Associate

Roman is an Associate Professor with the Department of Agricultural Economics and Research Associate of the Center. He works on agricultural issues such as land use and biofuels.

Kemal Sarica, Departmental Research Associate

Kemal is an energy economist with the Department of Agricultural Economics. He is primarily interested in energy market modeling, in particular policy design and implementation and resulting market responses in terms of price volatility and investment. He is currently investigating the electricity market, using an agent based modeling scheme.

Farzad Taheripour, Faculty Research Associate

Farzad is a Research Assistant Professor with the Department of Agricultural Economics and Research Associate of the Center. He has developed data and models to introduce bio-fuels into the GTAP framework and link the GTAP Model with water and energy models. He works on emissions due to land use changes associated with the production of first and second generations of bio-fuels.

Graduate students (*country of origin*)[2]

Zeynep Akgul (*Turkey*)

Zeynep Akgul is a PhD student in the Department of Agricultural Economics. She joined the Center for Global Trade Analysis in January 2011. She is currently working on the macroeconomic mechanisms and alternative closures in the GTAP Model.

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[2] See supplementary materials for graduate student CVs.

Uris Baldos *(Philippines)*
Uris Baldos is a PhD student in the Department of Agricultural Economics. He has worked on updating the global land use databases for GTAP versions 7 and 8. In addition, he has been assisting Thomas Hertel in the empirical implementation of a long-run partial equilibrium model of agricultural land use and undertaking econometric analysis of agricultural productivity.

Zekarias Hussein *(Ethiopia)*
Zekarias is a PhD student in the Department of Agricultural Economics. He is investigating the poverty implications of climate change mitigation policies, and working on updating the macroeconomic data and agricultural production targeting for GTAP 8. He is also working on the GTAP Africa Project.

Zeynep Burcu Irfanoglu *(Turkey)*
Burcu is a PhD student in the Department of Agricultural Economics. Burcu has worked on the CO2 emissions dataset and documentation. She is currently working on climate change mitigation policies in agriculture and forestry. More generally, she is interested in multilateral environmental agreements, international trade, mechanism design, and experimental economics.

Jing Liu *(China)*
Jing is a PhD student in the Department of Agricultural Economics. She is working on a USDA/DOE funded project aimed at incorporating irrigated agriculture, and water use by river basin, into the GTAP Model.

Visitors to the Center

Yongbin Zhu, Chinese Academy of Sciences, Shanghai, China

Xiao Liu, East China Normal University, Shanghai, China

Shan Li, East China Normal University, Shanghai, China

Huang Rui, East China Normal University, Shanghai, China

Zheng Wang, Chinese Academy of Sciences, Beijing, China

Changxin Liu, Chinese Academy of Sciences, Beijing, China

III.   Objective and Accomplishments

Progress towards Goals over Past Year

Below is an assessment of our progress towards the core objectives outlined last year in the Board meeting summary:
(http://www.gtap.agecon.purdue.edu/events/Board_Meetings/2011/documents/2011_Summary.pdf).

1. *Data Goal***:** To Improve the quality of Data Products.

Tasks	Individuals
Improving the quality of contributed I-O data (core)	**AA**
– Primary Priority:	
• Collaborate with UNECA, World Bank and AGRODEP to improve African I-O data	BN, TW

In March 2011, the UNECA hosted an I-O table contributor's course. One of the participants, Lacina Balma, has contributed the IO tables for Burkina Faso and Togo and is working on contributing the Guinea IO table. In addition to these, James Thurlow has provided 3 more recent African IO tables for processing. Two of these (Malawi and Zambia) are being processed by Zekarias Hussein (a graduate student at the Center) and another (Tanzania) is being processed by Pete Minor. Rob Davies has also provided an up to date Zimbabwe IO table, which is being processed by Badri Narayanan. Apart from these 7 new or updated tables, we have also included new tables for Namibia and Uganda in version 8.

• Collect feedback on EU tables from EU board members and collaborate with European board members (and EUROSTAT) to improve EU data	TW

At last year's meeting Joe Francois raised some issues regarding the intermediate demands of the services sectors. Some of these issues had already been addressed - most notably by the reallocation of dwellings, but other issues were to be further looked into by our EU board members. Martin Banse and Marijke Kuiper offered to review the German and Netherlands tables. We received feedback from Martin Banse that the high use of agriculture by the services sector was in the underlying German table (use of agriculture/food by the restaurants and public services). The issues raised by Joe were therefore found to be related to how the agricultural data was split for GTAP. Martin Banse contacted Marc Mueller, who worked on the contribution of the EU tables. We have not heard anything recently, however we do know that in the next version of EU tables agricultural sector will not be disaggregated by the contributor but will be done by the Center in-house. This may address the issues raised regarding the strange intermediate usage of the services sector.

Angel Aguiar received and reviewed a preliminary version of the new EU tables (2005) but due to several issues these were not ready to be included into version 8. We will continue to work with the contributor and EU board members to improve the quality of EU tables.

• Decisions/reviews to be made on chopping block and several African I-O tables	RMD, BN

Two of the countries listed on the chopping block for removal were received: Uganda and Venezuela. The remaining countries on the chopping block in version 8 (Hong Kong, Zimbabwe, Tanzania) were examined individually and it was decided not to remove them for the following reasons:

- *Zimbabwe: a newer table has not been made available by the country's statistical office. Following the review, small changes were made to improve the mapping. After reaching out to our network's members, a contributor (Rob Davis) has stepped forward with an updated table which we plan to include in the GTAP Africa Data Base based on v8.*
- *Tanzania: as mentioned above we are currently formatting the Tanzania table supplied by James Thurlow.*
- *Hong Kong: we have a possible contribution from Zhi Wang at the USITC. Unfortunately he was unable to meet the deadline for version 8.*

• Further examination on whether the treatment of the dwellings sector can be improved	RMD

The lack of an international data source and differences between country data have made it difficult to assess whether the dwellings data can be improved using the representative table. We have initial estimates that are currently being examined.

– Secondary Priority:	
• Exercises on converting Supply-Use-Tables to GTAP format	TW

Angel Aguiar is speaking with Scott McDonald about making final improvements to the GAMS program used to format the EU tables, so that these programs can be made available to the public.

• Undertake peer reviews of several I-O tables (including India, Senegal and Brazil)	

Peer reviews were not undertaken for any I-O tables, other than the EU tables discussed above. It is generally found that reviews are not done in a timely manner and are therefore of limited usefulness. In future we will not actively seek reviewers unless there is some concern about the IO table or a reviewer steps forward voluntarily.

– Tertiary priority:	
• Update FAO data for disaggregation	RMD
• I-O disaggregation module	RMD
• Incorporation of Metadata and treatment flags	BN

These items, along with a list of other future issues to be examined as part of the next release, are discussed below in the data section. In release 8, a start was made to incorporate metadata and treatment flags with the introduction of a new file, prepared by Angel Aguiar, showing the details of the contributed I-O tables. New domestic support header and tariff-component header also serve as metadata for users interested in more disaggregated information on these aspects.

Addition and Improvement of Other Datasets used in GTAP Data Base (core)	**BN**
– Primary Priority:	
• Alterations to construction program to fix commodity tax issues	RMD
• Review protection data set and suggested methodology changes from ITC	Antoine B. RMD and JS
• Finalize energy data for v8	
• International transportation data and investigate OECD data	NV and grad
• Services trade data	RMD
• Complete fixes and break up of domestic support with advice from Board members	Hsin, Hans, Martina
• CO2 emissions – now to be part of core	RMD
• Export subsidies	David L.
• Continue to interact with and support TASTE	David L. and Mark H.

Alterations to construction program to fix commodity tax issues: some initial changes were made to the construction programs; however more changes are required to address this issue fully. This is included in the list of priorities for future releases, discussed below.

Review protection data set and suggested methodology changes from ITC: Badri Narayanan will summarize where we stand on protection data at the board meeting. Antoine Bouët agreed to undertake a review of the current protection data and his report will be forwarded to the board when it becomes available.

Finalize energy data for v8: The energy volumes data were further refined in the GTAP 8 Data Base.

International transportation data and investigate OECD data: Nelson Villoria will be working on the International transportation margins data over the next year.

Services trade data: these were contributed by Arjan Lejour and Nico van Leeuwen from the CPB and incorporated into the GTAP 8 Data Base.

Complete fixes and break up of domestic support with advice from Board members: this has been done in release 8 by Badri Narayanan, with inputs from Hans Jensen.

CO2 emissions are now included in the GTAP 8 GTAPAgg and FlexAgg programs as part of the core GTAP Data Base. This greatly reduces the scope for errors and confusion in estimating GTAP-compatible emissions.

Export subsidies (for 2007) contributed by David Laborde were included in the GTAP 8 Data Base.

Continue to interact with and support the TASTE program developed by David Laborde and Mark Horridge. This is an important tool for the GTAP network and we are eager to see this valuable work continue. With the protection data in GTAP now contributed directly by the ITC-Geneva, the GTAP dataset now differs from the data contained in TASTE. It is important to the network that we do whatever is possible to limit the potential adverse implications of this. We plan to have a strategic discussion of these protection issues during the Board meeting.

– Secondary Priority:	
• Incorporation of skill splits from USITC and examination of the Social Hotspots work utilizing the skills data	TW
• Split *ad valorem* and specific tariffs in the standard model	BN
• NTM's presentation by ITC-Geneva at board meeting next year	TW
• OECD energy subsidies	
	Jean Chateau and Frank van Tongeren

Skills data: The Center has now received data from Marinos Tsigas, however further work is required to fill in the missing numbers. Alla Golub has offered to work on this task.

Badri, with the assistance of Azza Mohammed, has now included a header in the GTAP 8 Data Base that separates specific and ad-valorem tariff revenue. There were some issues with these data, mainly in the energy sectors in v8, and hence this header will be revised in v8a.

At last year's board meeting, Anders Aeroe stated that the ITC-Geneva were working on a new database of NTMs. We will hear from Anders at the board meeting about progress in this area.

We also heard from Jean Chateau about an energy subsidies database, similar to the Agricultural subsidies database, that the OECD has assembled. We will hear from Susan Stone at the board meeting about developments in this dataset.

Monitoring Data Quality using Comparison Programs (core)	**BN**

– Primary Priority:	
• Distribute sign-up sheets to board members for evaluating specific parts of the database upon each pre-release	

See appendix 2.

– Secondary Priority:	
• Comparing Simulation Results across databases	
• Produce reports on how much national I-O tables have changed as a result of FIT for documentation and review/comment by contributors	AA

Further work has not been undertaken on comparison programs, although the program developed by Robert McDougall to compare versions is used a great deal in checking new releases.

Versions and Documentation	**BN**

– Primary Priority:	
• Finalize Documentation of v7	RMD
• Final release of "time series" v8 for years 2004 and 2007	
• Develop a new bundling and pricing strategy featuring a special	TW

'energy-environment' bundle

Documentation for v7 and v8 are being finalized.

The GTAP 8 Data Base was released with two years: 2004 and 2007.

The new pricing strategy was developed and distributed to the board during the year. It has now been implemented in the context of the v.8 database.

– Secondary priority:

• Africa version of the GTAP Data Base	AA and TW
• Documentation of Construction Process	RMD, AA, TW
• Inter-Regional Input-Output (IRIO) version of GTAP (Zhi Wang and Joe Francois)	TW and RMD

A new special version of the GTAP Africa Data Base is expected to be released this year as part of the Africa project.

No progress has been made on documenting the construction process.

Zhi Wang has been working on a GTAP compatible IRIO. Zhi will report on his progress at board meeting.

Satellite Data Bases

– Primary Priority:

• Fund raising appeal for support of the Satellite databases (decision made at the post Satellite database meeting - information provided below)	TW, TH, MW
• Set up a website for sharing baseline data	TC and TW

The Fund raising appeal to support updates of the satellite datasets was successful with funds being provided by FAO, EPRI, Productivity Commission, OECD, US ITC and ERS/USDA. Thank you for your support in this important area.

Facilities for sharing baseline data are now available on the website. Some data has been provided, although as yet no-one has sent us any updated data. There will be an organized session on baseline data and analysis at the Conference this year.

– Secondary Priority:

• Make available some satellite datasets for v8, conditional on funding (non-CO2 emissions, Land use, GDyn, Migration etc.).	TH, RMD, TW
• Flesh out government accounts (Yontem Sonmez and Scott McDonald)	TW

Some of the satellite datasets were made available with the GTAP Data Base these included CO2 emissions, GDyn and GMig2. The updated land use data base will be provided to the Board prior to the meeting in Geneva. The non-CO2 emissions are being updated by Steve Rose and Amer Ahmed. Steve Rose will update us on the situation at the board meeting.

Foreign incomes, aid and remittances are being included as part of a new split-house facility

constructed for the Africa project.

Open Sourcing	BN
– Secondary Priority:	
• Pending funding decision on NSF-SI2 proposal led by the University of Chicago. If funded, this would facilitate a first move in the direction of open-sourcing some programs.	RMD

Unfortunately the NSF proposal was unsuccessful.

2. ***Research Goal*:** To actively participate in quantitative economic analysis of pressing global concerns.

Tasks	*Individuals*
Trade and Development	
– Primary Priority:	
• Continue to publish papers on trade, poverty, migration/labor.	TW, TH, NV, MV, BN, AA and grads

A list of activities is provided in the Research section below.

Tasks	*Individuals*
Global Energy and Environmental issues	
– Primary Priority:	
• Continue to publish papers on energy and environmental issues.	TH, WT, NV, AG, JS, FT and graduate students

A list of activities is provided in the Research section below.

3. ***Model Goal*:** To promote further development of GTAP-based models

Tasks	*Individuals*
Actively seek out potential papers for the GTAP Technical Papers (core)	
– Primary Priority:	
• GDyn-E Model	AG
• Finalize responses to reviews technical paper on poverty module	TW, TH, MV
• Finalize review of tariff aggregation tools (Will Martin and co-authors)	TW

– Secondary Priority:	TW, TH, NV, grads
Firm Heterogeneity Model	

GDyn-E: Alla Golub is currently working on a Dynamic GTAP version of the GTAP-E model, as well as documentation.

Tech paper on poverty module developed by Hertel, Verma, Rios and Ivanic is now available on the GTAP website. Erwin Corong is currently assisting with a detailed appendix.

A technical paper by Will Martin, Dominique van der Mensbrugghe and David Laborde on the implications of tariff aggregation is being revised following comments by reviewers.

Firm heterogeneity: PhD. Candidate Zeynep Akgul has started working on this under the supervision of Nelson Villoria and Terrie Walmsley.

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4. *Education Goal*: To expand and improve global economic analysis education worldwide

Tasks	Individuals
Increase access of Education to the network (core)	**TW**
– Primary Priority:	
• Short course in Purdue (August)	NV
• Work with Hans Jensen re Dynamic GTAP short course in 2012	MW
• Decide on 2013 location of short course	NV
• Education plan	NV
– Secondary Priority:	
• live forums	BN

The August 2011 Short course in Purdue was successful.

In 2012 two courses will be held. The Dynamic GTAP short course will be held in Denmark and hosted by Hans Jensen from the Danish Research Institute of Food Economics (FOI), Frederiksberg, Denmark. The standard GTAP short course will be held at George Mason University in the greater Washington, DC area, and is being hosted by Mary Burfisher.

Graduate Students	
– Primary Priority:	
• Implement a graduate student seminar series	NV

Nelson Villoria (jointly with Prof. Juan Sesmero) started a 1-credit PhD seminar "Advanced Topics in Energy, Resource, and Environmental Economics" that features GTAP applications and modeling methodologies. This seminar is intended to become the capstone course of the student group working on Energy, Resource, and Environmental Economics and should serve as a platform for both sharing research results and recruiting new students.

5. *Staffing Goal***:** To actively seek and encourage talented staff and graduate students

Tasks	Individuals
Actively encourage talented staff and graduate students (core)	**TW**
– Primary Priority:	
• Train Monica Woods, new Managing Director	MW
• Continue to recruit quality graduate students for research and data work.	NV

Monica Woods resigned in December, 2011. We are in the process of hiring an administrative assistant to assist the administrative team with finances, research grants and staffing matters. Meghan Alexander has also been promoted to Senior Program Manager.

6. *Collaboration Goal:* Actively seek opportunities for fostering collaboration with institutions around the world.

Tasks	Individuals
Seek partners and funding opportunities for collaboration (core)	
– Primary Priority	
• Implement collaboration with EU consortium led by Joe Francois	Everyone
• Continue to collaborate on GEOSHARE and associated potential for providing inputs into satellite data	TH, NV
• Reunion Project (Sydney Univ, WIOD, EXIPOL and IDE-JETRO)	TW
• Continue to collaborate on Energy and environmental data and research	TH, JS, AG
• Collaborate with UNECA, World Bank and AGRODEP on African data	TW, AA, BN

The first EU Project, using a GTAP PE-GE model to examine FTA between Europe and Central America was completed.

GEOSHARE: funding has been received for a pilot project which has now begun. Further details will be discussed at the board meetings

Terrie Walmsley presented on the GTAP Data Base with Glen Peters at a JETRO workshop in Japan. Walmsley is currently working on a chapter for a book on Multi-Region Input-Output analysis.

Africa project: as discussed above, the Center is collaborating with the World Bank on a project to mentor 6 African economists and update the GTAP Africa Data Base, as well as improve the

modelling infrastructure for analysis of African economies.

Energy collaboration: a list of projects can be found in the Research section below.

Develop a marketing plan for the Center and GTAP to expand the number of board members	**MW**

– Primary Priority:

- Potential board members, Purdue, Graduate students etc — TH, TW, MA, GB

- Looking for vignettes which can be used to promote GTAP to other organizations. — Board members

A number of new brochures have been developed by Ginger Batta and Meghan Alexander for specific audiences. If you have further suggestions or if you have a need for promotional materials, please speak with them.

Proposed Activities over the next year and beyond

The goals and objectives are discussed in detail below. Here we include a summary of the proposed objectives for the coming year.

1. *Data Goal*: To Improve the quality of Data Products.

Tasks	*Individuals*
Improving the quality of contributed I-O data (core)	**AA**

– Primary Priority:

- Collaborate with contributors, UNECA, World Bank and AGRODEP to improve African I-O data — TW

- Further examination of the dwellings sector and potential for improvement — RMD

- Update GTAP Technical Paper #1 which is the guide to contributing IO tables to the GTAP data base.

– Secondary Priority:

- Work with Scott McDonald to get the programs he developed to convert the EU tables to GTAP format into the public domain

– Tertiary priority:

- Improvements and updates to the Agricultural and non-agricultural disaggregation modules — RMD, BN

Addition and Improvement of Other Datasets used in GTAP Data Base (core)	**BN**

– Primary Priority:	
• Labor splits	TW
• Energy Data: Oil and gas fixes	RMD
• Fixes to Tariff data	
• Fix Export subsidies	
• GTAP-E for CO2 emissions	AG
• Continue to interact with and support TASTE	David L.
• International Transport Margins	NV

– Secondary Priority:	
• Inclusion of CO2 emissions in main data build process	RMD
• FIT Module changes for treatment of taxes & domestic support: Alterations to construction program to fix commodity tax issues	RMD
• Agricultural Production Targeting: include in construction	
• Protection Module changes	

Monitoring Data Quality using Comparison Programs (core)	**BN**

– Primary Priority:	
• Comparisons of IO before and after processing	AA, TW
• Comparisons between releases	RMD

Versions and Documentation	**BN**

– Primary Priority:	
• Finalize Documentation	RMD
• Release GTAP 8a Data Base (see Appendix 3)	
• Work with Mark Horridge to make GTAPAgg more flexible	

– Secondary priority:	
• Release GTAP 8.1 Data Base (see Appendix 3)	

Satellite Data Bases	

– Primary Priority:	
• Land use data and FLEXAGG program	BN, Uris, TH, NV

• Non-CO2 emissions and FLEXAGG	BN, TH, Amer Ahmed, Steve Rose

- Secondary Priority:

• MyGTAP: make current version public	TW, PM
• MyGTAP: include Government balances and taxes	TW, ZH, PM, SMD
• Support IRIO version (Zhi Wang and Joe Francois)	TW

2. ***Research Goal*:** To actively participate in quantitative economic analysis of pressing global concerns.

Tasks	*Individuals*

Trade and Development

- Primary Priority:

• Continue to publish papers on trade, poverty, migration/labor.	TW, TH, NV, MV, BN, AA and grads

Global Energy, Land Use and Climate Change issues

- Primary Priority:

• Continue to publish papers on energy and environmental issues.	TH, WT, NV, AG, JS, FT and graduate students

3. ***Model Goal*:** To promote further development of GTAP-based models

Tasks	*Individuals*

Actively seek out potential papers for the GTAP Technical Papers (core)

- Primary Priority:

• Finalize technical paper on GDyn-E Model	AG
• Finalize technical paper on tariff aggregation tools (Will Martin and co-authors)	TW
• Specific Tariffs paper	BN and NV
• Finalize paper on macro transmissions mechanisms	Zeynep, TW, TH, NV, RMD
• Finalize poverty technical paper appendix (more detailed guide for contributors)	TH

- Secondary Priority:

Tasks	Individuals
Technical paper on a Firm Heterogeneity Model	Zeynep, NV, TW
Technical paper on International Transportation Margins	NV

4. *Education Goal*: To expand and improve global economic analysis education worldwide

Tasks	*Individuals*
Increase access of Education to the network (core)	**TW**
– Primary Priority:	
• Short course in Washington DC (August)	NV
• Dynamic GTAP short course in Denmark	
• Prepare Education plan	NV, MB, AA
– Secondary Priority:	
• Live Forums on topics of interest to the Network	BN
Graduate Students	
– Primary Priority:	
• Continue graduate student seminar series	NV
• Enhance web presence for recruitment of potential graduate students	NV, TH

5. *Staffing Goal*: To actively seek and encourage talented staff and graduate students

Tasks	*Individuals*
Actively encourage talented staff and graduate students (core)	**TW**
– Primary Priority:	
• Find a financial coordinator for research accounts	MA, GB

6. *Collaboration Goal:* Actively seek opportunities for fostering collaboration with institutions around the world.

Tasks	*Individuals*
Seek partners and funding opportunities for collaboration (core)	
– Primary Priority	

• Collaboration with EU consortium led by Joe Francois	Everyone
• Continue to collaborate on GEOSHARE and potential for providing inputs into satellite data	TH, NV
• Continue to collaborate on Energy and Environmental data and research	TH, JS, AG

IV.   The GTAP Data Base and Other Data Projects: Progress and Future Objectives

In this section we concentrate on the primary product of the GTAP network – the GTAP Data Base. In the first sub-section, we summarize the new GTAP 8 Data Base which was released in early 2012. In the second subsection, the timetable and priorities for future versions of the GTAP Data Base and satellite datasets are discussed.

The GTAP 8 Data Base

An overview of the evolution of the GTAP Data Base is provided on the website:

http://www.gtap.agecon.purdue.edu/about/history.asp#db

In March 2012, the GTAP 8 Data Base was made available to the public. The new version has the following new features:

- Dual reference years: 2004 and 2007:

A key feature of the GTAP 8 Data Base is that for the first time in the history of GTAP Data Base, we have two reference years: 2004 and 2007. This move towards two base years is in response to an increase in the number of inquiries about using different versions of the GTAP Data Base together as a type of time series dataset. The two datasets representing the two base years in the GTAP 8 Data Base are both valued in current US Dollars of their respective years: 2004 and 2007. Unlike the GTAP 7 data base, which is also benchmarked to the year 2004, the v.8 2004 data base uses, wherever possible, exactly the same sources and procedures as for the v.8 2007 data base. In this way, we eliminate any spurious differences between the two base years, and the remaining differences may be attributed to real changes in the global economy over this period.

- Additional regional disaggregation: 129 regions and 57 sectors

Newly added regions (contributors) include Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates (contributed by David Green), Israel (Khalid Siddig), Namibia, Mongolia (Michael Begg), Cameroon (Christian Emini), Kenya (Peter Wobst), Ghana (Charles Adjasi and Emmanuel Kinful), Cote d'Ivoire (Kone Youssouf and Souleymane Diallo), Honduras, El Salvador (Jose Duran), and Nepal (Selim Raihan and Bazlul Khondker).

Updated/improved regions (contributors) include: Australia (Patrick Jomini, Simon Hone, and Alexandra Strzelecki), Brazil (Joaquim Bento), the Philippines (Erwin Corong), Mexico (Aida Gonzalez-Mellado and Claudia Octaviano), Venezuela (Roberto Ferrer, Agustin Velasquez and Jorge Hernandez), Norway (Glen Peters), India (Rajesh Chadha and Anjali Tandon), China (Liu Yu and Li Xiangyang), Malaysia (Nhi Tran), Uganda (Isabel Teichmann), Thailand (Tosapol Apaitan) and Switzerland (Renger van Nieuwkoop and Carsten Nathani).

A full report on the IO tables is available in the supplementary materials:

https://www.gtap.agecon.purdue.edu/events/Board_Meetings/2012/supp_material.asp

- New macro-economic data for 2004 and 2007

The macro data has been updated with the latest estimates from the World Bank's WDI dataset (GDP and its components), the IMF's financial statistics (government expenditure) and UN/national sources by Zekarias Hussein and Angel Aguiar.

The trade data for 2004 and 2007 was obtained from Mark Gehlhar using UN COMTRADE data. The 2004 data were different from the data contributed for GTAP 7 Data Base, as they were revised based on improvements in the source data.

- New protection data for 2007

New tariff data contributed by Houssein Guimbard (CEPII) in conjunction with Mondher Mimouni (ITC-Geneva). The data is based on the ITC-CEPII MacMAP Data Base for 241 exporting countries (partners) and 225 importing countries (reporters). GTAP 7 inputs from David Laborde (CEPII and IFPRI) and ITC-Geneva were used for 2004.

- New Time-Series Bilateral Trade data from 1995-2009

New time series trade data was contributed by Mark Gehlhar using UN COMTRADE data.

- Improved bilateral services trade data for 2004 and 2007

New bilateral services trade data for 43 countries was contributed by Nico van Leeuwen and Arjan Lejour. Where we don't have bilateral services trade estimates, we use IMF services exports and imports estimates, apportioning across trading partners in proportion to GDP.

- Improved energy data for 2004 and 2007

New data and improvements were made by Robert McDougall, Jevgenijs Steinbuks and Zeynep Burcu Irfanoglu.
  1) Energy Volumes Data from IEA Energy Balances.
  2) Energy Price and Tax Data from:
      a) IEA Energy Prices & Taxes
      b) OLADE Price Data for Latin America
      c) Ad hoc Price Data for China and Mozambique
  3) Energy Import & Export Cost Data from IEA Prices & Taxes

- Revised OECD domestic support for 2004 and 2007

Hsin Huang (OECD) and Hans Jensen (FOI) contributed new domestic support data for both 2004 and 2007 for the OECD member countries and the EU member countries respectively.

- New export subsidies data for 2007

David Laborde (IFPRI) contributed the new bilateral export subsidies data for 16 GTAP sectors for exports from 36 countries to 213 destination countries, for the year 2007. The 2004 export subsidies data in GTAP 8 Data Base is based on inputs from GTAP 7 Data Base.

Joseph Francois and Julia Wortz contributed the Export Tax Equivalents (ETEs) of MFA (Multi-Fiber Arrangement) Quotas in GTAP 7 Data Base and these were used for the 2004 GTAP 8 Data Base. Given

the phasing out of these quotas by 2005, these taxes were zeroed out for most countries' textile and apparel sectors in the 2007 version of GTAP 8 Data Base. China was the only exception. China still faces some quotas in the USA and EU markets as part of their WTO accession agreement. Export tax equivalents were assumed to decline through 2007 to the extent that quotas were increased from 2005 to 2007, for Chinese exports. In other words, we assumed that the ETEs and quotas change by the same percentage but in the opposite directions. The changes in quotas are based on data from European Commission's website:

http://trade.ec.europa.eu/doclib/html/123754.htm.

- Metadata:

Additional information on contributed I-O tables: An additional I-O metadata file has been provided with the public release of GTAP 8 Data Base. This contains detailed information on various contributed I-O tables to the database.

- Detailed Information on tariff and support data:

In the final release, we have incorporated two new headers that show more detailed information on tariff/support data: Decomposition of tariff (into ad valorem and specific) and OECD domestic support payments data (into different types of payments based on the extent of decoupling and base). The former decomposes the tariff revenue into specific and ad valorem tariff revenue, added to the value of imports at world prices (VIWS). However, we found an error in the construction of this header, which will be fixed in an imminent bug-fix version, to be called the GTAP 8a Data Base (see below).

- CO2 emissions dataset integrated into core database

CO_2 emissions data has now been integrated into the core GTAP 8 Data Base, by Zeynep Burcu Irfanoglu and Robert McDougall.

- Agricultural Production Targeting:

Zekarias Hussein processed the contributed I-O tables to target the agricultural production data from Hsin Huang and Hans Jensen for OECD countries, including EU member states. All twelve GTAP agricultural sectors are included in this exercise, as was done in GTAP 7.1 Data Base, for both 2004 and 2007. Brazil and South Africa have been excluded from this exercise, since we do not have 2007 agricultural production/support data for these countries.

- Documentation:

The GTAP 8 Data Base documentation is currently being collected. If you have contributed we would be grateful if you could update your documentation quickly, as users of the GTAP Data base greatly appreciate being able to refer to and reference the documentation. References to the work of contributors also represent an important means of acknowledging these important contributions. The documentation is available on the website at: https://www.gtap.agecon.purdue.edu/databases/v8/v8_doco.asp

Satellite Data and Utilities

Thanks to the success of the fund raising appeal last year to support updates of the satellite datasets progress has been made on a number of datasets:

Non-CO2 Data: For the GTAP 8 Data Base, Amer Ahmed has agreed to contribute the non-CO2 dataset later this year. He is currently working with Steve Rose. We will hear from Steve Rose at the board meeting regarding progress in this area.

Land use Data: Land-use data for the GTAP 8 Data Base is being developed by Uris Baldos and Tom Hertel. Updated land use data will be developed for 18 Agro-ecological zones for both base years: 2004 and 2007. Version 8 will be constructed using the same methods and data used in version 7. At this time an initial version of the updated database has been generated and we hope to make it available to the board for review several weeks ahead of the Board meeting in Geneva.

GDyn Data: Terrie Walmsley and Angel Aguiar constructed a GDyn data base to accompany GTAP v.8. This is available for the GTAP 8 data subscribers.

GMig2 Data: Angel Aguiar and Terrie Walmsley have constructed the GMig2 data for GTAP 8 Data Base. This is available for the GTAP 8 data subscribers.

Ensuring Quality: Comparisons, Reviews and Outstanding Concerns

Quality reports and issues related to the GTAP Data Base are placed on the GTAP website and updated regularly.

a) The issues raised since the recent public release of the GTAP Data Base and our response to these issues can be found at: https://www.gtap.agecon.purdue.edu/access_board/GTAP8.asp#issues. There are a number of issues related to software and the additional datasets that do not affect the core database, but which we plan to fix over the next month with the release of the GTAP 8a Data Base. The issues to be fixed in this minor release include (see Appendix 3):

   o As noted above some additional disaggregated data was provided in an additional header VTTS. It was recently discovered that the data in this header is not usable because of serious errors that cause it to be inconsistent with the core GTAP Data Base.
   o Flexagg for the GTAP 8 Data Base does not automatically aggregate CO2 emissions data
   o Some users of older versions of Gempack have had problems using the GTAP 8 Data Base, due to changes in the sparse storage format of header array files. We do not want the GTAP Data Base to be incompatible with older versions of Gempack and hence we have decided to fix this in the upcoming release.
   o Flexagg for GDyn 8 Data Base does not automatically produce header H0 required by the GDyn model.
   o Zero bilateral migration in GMig2 DB gives room can result in computational errors in the GMig2 model (for certain aggregations).

b) Reports on the quality of contributed I-O tables are provided on the website at: https://www.gtap.agecon.purdue.edu/access_board/IO/default.asp

c) At last year's board meeting Antoine Bouët agreed to review the tariff dataset provided for version 8 by Houssein Guimbard (CEPII) in conjunction with Mondher Mimouni (ITC-Geneva). We will forward this report to you as part of the supplementary materials as soon as it becomes available.

The GTAP Data Base: Priorities for Future Releases

In this section we outline a couple of priority areas for prerelease 8.1 and for public release v9.

Tariff Data

CEPII continue to be responsive to Center and network queries about the tariff data, including the inclusion of FTAs and the fixing of a few small errors on tariffs between the EU and its protectorates. This responsiveness is critical to the credibility of the GTAP data base in high profile trade policy debates. There are however a few questions/concerns that are worth discussing:

1. Can we expect this relationship between CEPII and ITC-Geneva to continue as it did in the v8 cycle? If not what is going to change? How will this affect the ability of users to obtain timely responses to their queries?

2. The 2004 v8 protection data is based on v7; while the 2007 v8 data is based on the new methodology documented on the website. We would prefer to obtain updated data for all years in v8, with same sources and methodology, thereby making the time series data more valuable to those interested in trade policy. To what extent is the provision of time series data going to create difficulties for ITC-Geneva and CEPII?

3. The TASTE program was an important innovation for the GTAP community. ITC-Geneva and CEPII have indicated that they are willing to share data with David Laborde to ensure the continuation of this product. What do we need to do to ensure continuation of this important work?

4. Antoine Bouët's report to the Board on the new tariff data base.

Protection Data Processing Module

In addition to developments with the source data, we also need to remove tariffs on travelers' expenditures, which show up in the trade flows, and retain tariffs on zero trade flows, by using reference-group-weighted tariff for zero or very small trade flows.

Adjustments also need to be made to export subsidies so that 2004 data is consistent with 2007.

There is also the question of how to deal with additional TRQ rents not currently included in GTAP.

Energy subsidies from OECD

At last year's board meeting Jean Chateau from the OECD mentioned that there was a project, similar to the domestic support project to estimate energy subsidies. At this stage we have no specific plans to include this in the GTAP Data Base, but look forward to hearing about recent developments at the board meeting. Given the successful collaboration between the OECD and GTAP in the area of agricultural protection data, we expect that there may be valuable opportunity for collaboration in this new area of work.

Taxes and Domestic Support

A number of technical changes are required to the FIT Module to ensure that we stop removing commodity taxes from IO tables and that we appropriately target domestic support rates in the protection module. Targeting the domestic support rates will also make the decomposition of the domestic support now provided in the GTAP Data Base more useful.

Labor Skill Splits

Skills data has been received from Marinos Tsigas which will permit further disaggregation of the labor force in GTAP. However this new data base has not been completely filled in and processed. We plan to include this data in version 8.1.

Agricultural Production Targeting

Agricultural production targeting was introduced to improve the agricultural production data, particularly in the European IO tables. The agricultural production targeting is currently done prior to the database construction process itself and is susceptible to human error as files get transferred between staff members. Since agricultural production targeting is still desired by board members, we have decided that it should be included in the main build process so that such errors can be reduced.

Agricultural and Non-Agricultural Disaggregation

In v9 we plan to update the FAO agricultural data, previously processed by Everett Peterson and used to disaggregate agriculture in those IO tables requiring further disaggregation. We also plan to fix a few issues in this module related to the ordering of non-agricultural and agricultural disaggregation – tasks which the Center is increasingly called upon to undertake as GTAP's country coverage expands.

Energy

Minor improvements in the construction of energy volumes, prices, taxes and emissions datasets are expected to be made in the version 9 data cycle."

Set Labeling

Some of you may have noticed that a couple of the 3-letter *country* codes are identical to existing 3-letter *sector* codes. While this does not seem to result in any big issues for GAMs or Gempack users, it can affect the ordering of countries when some lesser-known GAMs programs are used. As a result we do plan to change our commodity codes. If you have any preferences please feel free to express them to Badri Narayanan.

GTAPAgg

There are two issues related to GTAPAgg:

First, with the number of satellite datasets and aggregation programs having increased significantly with this release, not only have the number of datasets and accompanying GTAPAgg/FlexAgg programs which need to be downloaded increased, but the number of checks that we need to undertake to check the data and ensure the software are compatible has also increased. We would like to work with Mark Horridge so that different datasets can be accommodated by the same GTAPAgg program.

Second, increasingly we would like the flexibility to add extra headers which should not be aggregated, but are only for information or are aggregated in a more complicated way.

We plan to work with Mark Horridge to see what can be done to rationalize these programs and streamline downloads.

Other Data Related Activities: Progress and Priorities

GTAP Africa Project

The aim of the GTAP Africa Project is to improve the quality and coverage of the African economies and to include more inter-regional and intra-institutional data to improve modeling of African economies.

In terms of regional country coverage, we have been working with a number of colleagues in Africa. We plan to construct a second Africa Data Base based on version 8.1, taking advantage of the following contributions:

- Lacina Balma: Contributed Burkina Faso and Togo and is currently working on Guinea

- James Thurlow: has recently provided unprocessed tables for Malawi, Zambia and Tanzania

- Rob Davies: has provided a more up-to-date Zimbabwe IO table

- Michael Begg: contributed Namibia

- Isabel Teichmann: contributed Uganda

A new program, nicknamed MyGTAP has been developed by Peter Minor and Terrie Walmsley to adapt the GTAP Data Base to the specific needs of different users in Africa. The program has a number of functions: first, a country's I-O data can be split to include multiple households and endowments based on splits supplied by the user; second, inter-regional flows such as capital and labor remittances and foreign aid are included in the database; and finally, detailed intra-institutional flows are to be included based on previous work done by Yontem Sonmez, Scott McDonald and Terrie Walmsley. This last step is still work in progress. Documentation for these is available on the GTAP website at:

https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=3810

If you are interested in having access to these programs please contact Terrie Walmsley.

Multi-Regional Input-Output (MRIO) Tables and Time-Series Datasets

Zhi Wang, Marinos Tsigas and Mark Gehlhar have been working on a GTAP based IRIO/MRIO database. Zhi Wang will present his work at the GTAP board meeting. We hope to release a GTAP-IRIO to board members shortly for review.

V.   Research and Model Development: Progress and Future Objectives

Research Goal: To actively participate in quantitative economic analysis of pressing global concern in the areas of: Trade and Development; and Global Energy, Land Use and Climate Change.

Model Goal: To promote further development of GTAP-based models

These two goals have been combined here because in selecting areas of research the center endeavors to also further develop the GTAP suite of models. Below we discuss research and Model development in two key areas: Trade and Development; and Global Energy, land use and climate change.

Trade and Development

Trade and development continue to offer important opportunities for the Center in terms of research and database development. The number of research challenges in the area of trade and development continues to grow. The Center is actively involved in research in trade policy, poverty and migration, and several models and model extensions have been further developed this year in these areas.

Core Funded Projects

The further development of the Static and Dynamic GTAP Models continue to be core research for Center staff. Research activities conducted this year included:

- The book documenting the Dynamic GTAP Model was published in April 2012. Another short course introducing network members to this modeling framework will be offered this summer.

- A technical paper outlining the GTAP poverty model and application was published this year in the GTAP Technical paper series. Erwin Corong is currently assisting Tom Hertel in supplying an appendix that would further assist those wishing to contribute data for this module. The authors hope that country coverage will be significantly expanded as individual network members estimate the necessary parameters using household survey data from their respective countries. We are already working with a contributor who wants to include Sri Lanka in this module.

- In their paper published in *Economics Letters*, Verma, Hertel and Preckel (2011) show that the AIDADS demand system estimated using international cross section data, along with data on national total expenditure distributions, performs quite well when predicting the pattern of food expenditures within a given country (Bangladesh) – particularly at low income levels. This suggests that GTAP-based estimated demand systems could provide a useful approach for predicting expenditure patterns for the poor, by GTAP commodity category – a necessary pre-requisite for undertaking poverty analysis within the GTAP framework.

- A graduate student, Zeynep Agkul, has been assisting Robert McDougall, Terrie Walmsley, Thomas Hertel and Nelson Villoria in documenting a macroeconomic decomposition tool for the GTAP technical paper series. This tool will aid GTAP users in better understanding the mechanisms driving economy-wide results in the GTAP Model.

- Angel Aguiar is working with Terrie Walmsley on documenting recent modifications to the GMig2 model, including the integration of the GMig2 model with the Dynamic GTAP Model to create a Dynamic migration model, GMig2Dyn; the inclusion of undocumented workers; and imperfect substitutability between foreign and domestic workers. This has been used to examine the impact of changes in US migration policy on undocumented Mexican workers.

- Badri Narayanan is also working with Tasneem Mirza and Nico van Leeuwen to finalize a paper examining the impact of China's growth and liberalization on US labor market, as an application of the detailed labor splits data from USITC.

- Zeynep Agkul is also incorporating a simplified theory of heterogeneous firms into the GTAP Model, based on the earlier work of Fan Zhai, and will be working with Fan Zhai, Nelson Villoria, Thomas Hertel and Terrie Walmsley in the implementation of that model.

- Badri Narayanan and Nelson Villoria are working on a version of the standard GTAP Model that would include both specific and ad valorem policy instruments. This is important for accurate representation of tariffs, and it is also very important when modeling domestic support policies for agriculture.

Externally Funded Projects

1. PE-GE Analysis of the EU's FTAs with the Andean Pact, and with Central America, European Commission, 2011

Staff: Terrie Walmsley, Badri Narayanan and Angel Aguiar

Collaborators: Joseph Francois

CGE models are widely utilized for the evaluation of FTAs, yet they are typically highly aggregated limiting their usefulness to trade negotiators interested in impacts at the tariff line. Partial Equilibrium (PE) models used for disaggregated analysis lack the benefits of an economy-wide analysis required to examine the overall impact of trade policy reforms. This suggests the need for a PE-GE, nested modeling framework to support real-time trade policy analysis. Narayanan, Hertel and Horridge (2010) develop a PE model that captures international trade, domestic consumption and output of disaggregated products, incorporating sectoral production possibility frontiers, market clearing conditions and price linkages for these disaggregated goods, all nested within the standard GTAP Model. This permits policy makers to evaluate both the economy-wide benefits of the FTA as well as the disaggregated production impacts within the same overall framework. In this project this PE-GE modeling framework was used to evaluate the impact of FTAs between the EU and the Andean Pact and Central America, focusing on the impact on trade in bananas.

2. Quantitative Analysis of Vulnerability Reduction and Diversification in Africa, World Bank and Netherlands Partnership program, 2011-13

Staff: Terrie Walmsley, Badri Narayanan and Angel Aguiar

Collaborators: Peter Minor, Will Martin, Stephen Karingi, Mary Burfisher, Scott McDonald and Anna Strutt

The GTAP Model is widely used to examine the impact of trade liberalization on the global economy; however the GTAP Model and database do not include many of the features prevalent in developing countries, such as the government's heavy reliance on foreign aid and import tax revenues, and the need for examining the impact of policies at the household level. Access to quality data in developing countries is also problematic. This project hopes to improve analysis in a number of areas. First, a course was held in Africa and hosted by the UNECA. Second, with the assistance of collaborators we have collected a number of new and more recent IO tables for African countries to update the African GTAP Data Base. Third, a program has been developed that incorporates remittances, foreign aid and foreign capital income into the GTAP Data Base and allows a user to further split the endowments and households of one or more regions and include intra-regional transfers in the GTAP Data Base. Fourth, a revised model has

been developed which includes these new features - inter-regional flows, the separation of the government sector from private households and multiple households. Fifth, six African economists have been selected to receive mentoring support and write papers on vulnerability and diversification in Africa. This project will be completed over the next year and a half.

3. Modelling services and/or investment related policy measures, USITC, 2011-

Staff: Csilla Lakatos

Collaborators: Tani Fukui

The principal focus of this project is the construction and policy application of a global database on the activities of foreign affiliates and model that is being constructed within the GTAP framework. Prior efforts at modeling the activities of foreign affiliates in a CGE framework use FDI data as a proxy for measuring the output and input structure of foreign affiliates. By contrast, this project makes use of foreign affiliate operations data, which allows us to directly estimate sales and value added shares of foreign affiliates by country of ownership and sector. The project should enhance the ability to analyze the policy implications of services and/or investment related policy measures.

4. Understanding the cross-country correlation of supply shocks to agricultural production. Incentive Award from Purdue University Global Policy Research Institute, 2011-12

Staff: Nelson Villoria, Thomas Hertel

Collaborators: Hao Zhang, David Ubilava, Dev Niyogi

Although weather correlation across countries is crucial for the analysis of trade (and its interactions with storage) it is largely ignored in the literature. As our understanding of climate processes – variability and change - improves, so does our understanding of the evidence of correlated climates across large geographic regions. The proposed research will fill the gap between trade- storage- and weather links by explicitly modeling the effects of geographically correlated weather patterns on bilateral trade patterns. This research has a heavy statistical component and explicit policy relevance that comprises of reducing the large climatological datasets used to simulate future climate using general circulation models and using these variables to explain bilateral trade patterns. From the statistical work, we will parameterize a computational economic model that allows relating weather shocks to the uses of agricultural supply: consumption, trade, and storage. Such tools will offer valuable insights into various policy issues for dealing with food price instability.

Publications

Below is a list of papers in this area that have emerged from the Center recently in the area of trade and development:

Ahmed, S.A., T.W. Hertel, and T.L. Walmsley, 2011. "Outsourcing and the US Labour Market", World Economy 34(2):173-329

Chappius, T. C., and T. L., Walmsley, 2011. "Projections for World CGE Model Baselines", GTAP Research memorandum no. 22, https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=3728

Hertel, T.W., 2011. "Alan Deardorff's Contributions to Computational Analysis of International Trade", in Comparative Advantage, Economic Growth, and the Gains from Trade and Globalization: A Festschrift in Honor of Alan V. Deardorff, edited by Robert Stern, University of Michigan Press.

Hertel, T. W. 2012. "Global Applied General Equilibrium Analysis using the GTAP Framework", in The Handbook of Computable General Equilibrium Modeling, edited by Peter Dixon and Dale Jorgenson, part of the Handbook of Economics Series from Elsevier Publishers.

Ianchovichina, E.; and Walmsley, T. L., 2012. (eds): *Dynamic Modeling and Applications in Global Economic Analysis,* To be published by Cambridge University Press

Laborde, D. and Lakatos, C., 2012. "Market Access Opportunities for ACP Countries in Environmental Goods", ICTSD Programme on Trade and Environment, Issue Paper 17, February.

Lakatos, C., and T. L. Walmsley, 2012. "Investment creation and diversion effects of the ASEAN–China Free Trade Agreement", Economic Modelling, Volume 29, Issue 3, May, Pages 766-779.

Lakatos, C. and Fukui, T., 2011. "*Measuring Economic Globalization: a Database on the Activities of Foreign Affiliates*", ITC working paper, August

Narayanan, B. G.; and Vashisht, P., 2011. "Determinants of Competitiveness of Indian Auto Industry", Lambert Academic Publishing, Germany.

Özden, C.; Parsons, C.; Schiff, M.; and Walmsley, T. L., 2011. "Where on Earth is Everybody? The Evolution of Global Bilateral Migration 1960-2000", *World Bank Economic Review*, June, 1-45.

Strutt, A.; and T. L. Walmsley, 2011. "Implications of the Global Financial Crisis for China: A Dynamic CGE Analysis to 2020" *Economics Research International*, October.

Verma, M., T.W Hertel and Paul V. Preckel 2011. "Predicting Within Country Household Food Expenditure Variation using International Cross-Section Estimates", Economics Letters 113:218-220.

Verma, M., T.W Hertel and E. Valenzuela, 2011. "Are the Poverty Impacts of Trade Reforms Invisible?", *World Bank Econ Rev 25(2): 190-211.*

Villoria, N.B. 2012. "China's Growth, World Food Prices, and Developing Countries Exports". *Agricultural Economics*.

Walmsley, T. L.; A. L. Winters; and S. A. Ahmed; 2011. "The Impact of the Movement of Labour: Results from a Model of Bilateral Migration Flows," *Global Economy Journal*, Vol. 11: Iss. 4, Article 2.

Walmsley, T.L.; Aguiar, A.; and Ahmed, S. A., (forthcoming) "Labour Migration and Economic Growth in East and South-East Asia," chapter in A. Ahsan (ed) International Migration and Development in East Asia, World Bank, Washington DC.

Walmsley*, T. L.; and Winters, L. A., 2012. "Relaxing Restrictions on the Temporary Movement of Natural Persons: A Simulation Analysis" in: Anderson, K., and B. Hoekman Critical Perspectives on the Global Trading System and the WTO, Edward Elgar, Spring.

Global Energy, Land Use and Climate Change

From the point of view of the Center's research agenda, "Energy and the Environment" (E&E) refers to research into global environmental issues with significant trade dimensions. Currently this encompasses policies related to climate change impacts, climate change mitigation, as well as biofuels and other renewable energy policies and their implications for global trade, land use emissions and economic welfare. These are broad topics, and many in the network are working in these areas. The Center's current research agenda emphasizes the land use, agriculture, forestry, and poverty dimensions of these policies. Agriculture, forestry and associated land use change currently account for about 30% of global greenhouse gas emissions, and, according to estimates in Golub et al (2009), could supply up to 50% of economically efficient abatement globally, in the near term, at modest carbon prices. However, these sectors have been historically neglected in most (fossil-fuels oriented) CGE-based studies of climate policy. Therefore, this area of climate policy has become a focal point for the Center's research in climate mitigation policy. Furthermore, since such policies could have significant impacts on food prices, exploration of the food security and poverty impacts are also warranted. In addition, since these policies

could have major implications for water resources, the Center has developed research projects in this area as well.

Externally Funded Projects

Research in the Energy and Environmental area has resulted in the further development of the static and dynamic GTAP Models, as well as the development of a number of satellite datasets, which we recently included in the core GTAP Data Base. However, in terms of research and model development, this is an area where the Center has managed to obtain quite a bit of external funding, so we have devoted considerable staff resources to these topics.

One project of importance to the core development of the Dynamic GTAP Model is the project funded by the US Department of Energy (DOE) which will result in the development and documentation of a Dynamic GTAP-E model, GDyn-E. This model is being done by Alla Golub and the resulting model is being applied to analyze the impact of the proposed US Clean Energy Standard on patterns of trade and global investment flows. Alla Golub is further extending GDyn-E in two directions under two other projects. With funding from the US-EPA, she is introducing biofuels into this model based on a new GTAP-BIO model and database developed by Taheripour and Tyner (2011) and by Tyner, Taheripour, and Golub (2011). With funding from EPRI, Alla Golub is adding Greenhouse Gases and climate mitigation policies. With the resulting model in hand, Golub and her collaborators are looking at the interaction between biofuels and climate mitigation policies, among other things. In other work pertinent to GTAP-E, Beckman et al. (2011) utilize a stochastic simulation approach to validate this model with respect to its ability to reproduce medium term price volatility in the oil market. They conclude that the model's energy demands are far too elastic. This is confirmed by a comparison with the recent econometric literature on this topic. After revising the consumer and industrial demands downward in keeping with this literature, the authors find the model performs much better in the validation exercises. Another project in the energy-environment area explores the interaction between irrigation and biofuels production (Taheripour et al., 2011). This work, funded by a USDA-DOE grant, is leading towards a version of GTAP which disaggregates water use in GTAP.

Tyner and Taheripour in several joint projects with Argonne National Laboratory and California Air Resources Board introduced several biofuels pathways into the GTAP-BIO database and its modeling framework. Due to these attempts the new GTAP-BIO model is now capable to assess the land use consequences of a wade rage of biofuel pathways including grain based ethanol, sugarcane ethanol, biodiesel produced from several types of vegetable oils (e.g. soybean oil and palm oil), and ethanol and bio-gasoline (a drop-in biofuel) produced from cellulosic materials such as corn stover, switchgrass, and miscanthus (Taheripour and Tyner (2011); Tyner and Taheripour (2012); Taheripour, Tyner, and Wang (2011); and Tyner, Taheripour, and Golub (2011)). The recent research results obtained in this area will be presented at the Conference in Geneva.

Finally in a project funded by the USDA and DOE, Tyner and Sarica in collaboration with Taheripour have developed several research studies in energy economics using the GTAP and MARKAL models. The results of these activities are presented in several conferences (Sarica and Tyner (2011a, b) and under review for publication.

Tyner and Taheripour have also developed several proposals to use GTAP-BIO model in the areas of environmental and energy economics which are pending with USDA, DOE and other supporting agencies.

Center for Robust Decision Making under Uncertainty for Climate and Energy Policy, National Science Foundation, 2010-2015

Staff: Tom Hertel, Jevgenijs Steinbuks

Collaborators: Judd, Cai and Munson

Developed a dynamic forward-looking model of socially optimal land-use decisions. Results published in GTAP Working Paper 64. "The Optimal Allocation of Global Land Use in the Food-Energy-Environment Trilemma", currently under review in the *Journal of Environmental Economics and Management*. Research was presented and is scheduled for presentation in a number of research conferences (EMEE, AGU, ASSA, EAERE, GTAP Annual Conference, Cowles Summer Conference on Macroeconomics and Climate Change). Ongoing work on a second paper, aimed at the environmental sciences audience is underway. Further work in progress involves the development of stochastic extensions of this intertemporal model (in collaboration with Judd and Cai).

Economic and Environmental Consequences of Widespread Deployment of Solar Photovoltaics, Purdue Global Policy Research Institute, 2012-2013

Staff: J. Steinbuks

Collaborators: Fu Zhao, Chong Xiang, and Carol Handwerker

Development of a dynamic partial equilibrium model aimed to explain economic trade-offs between traditional and solar energy, and consumer electronics sector, which competes for rare metals with solar photovoltaics. The model is to be calibrated based on GTAP data. Currently searching for a research assistant to incorporate solar energy into a GTAP dataset.

Effects of GHG Mitigation Policies on Livestock Sectors, Phase II, FAO, 2010-2012

Staff: Alla Golub, Tom Hertel, Burcu Irfanoglu

Collaborators: Ben Henderson

Further development and improvement of GTAP-AEZ-GHG model. Transition of current GTAP-AEZ-GHG model from GTAP v.6 to v7; incorporation of multiproduct dairy, split ruminant and non-ruminant sectors into large and small animals subsectors, incorporation of agricultural soil carbon sequestration; further refinement of climate change mitigation policy scenarios. Several presentations were made based on this work: 2011 AAEA Annual meeting, 30th International Energy Workshop, at Food Security and Environment seminar series at Stanford University, at conference at Waikato University, at the 14th Conference on Global Economic Analysis and OECD workshop on climate change modeling in agriculture (Paris). A paper analyzing global agricultural mitigation from reducing emissions and enhancing soil carbon stocks is in development for presentation at the Conference in Geneva.

Estimating Market Potential for Greenhouse Gas Abatement, EPRI, 2010-2012

Staff: Alla Golub, Tom Hertel,

Collaborators: Steven Rose (EPRI), Brent Sohngen (Ohio State University), Robert Beach (RTI)

Introduction of risk and transaction costs associated with agricultural offsets into GTAP-AEZ-GHG model. This project is an analysis of the market potential of global land-based GHG mitigation opportunities. EPRI provides Purdue with adjusted agriculture and forestry marginal abatement cost curves (MACs) that reflect investment risk and transactions cost for representative projects in each GTAP Modeling region. Purdue recalibrates the model to the revised MACs and run a set of baseline and climate policy scenarios as defined by EPRI.

Global Agriculture and Forestry Greenhouse Gas and Renewable Energy Research, EPRI, 2010-2012

Staff: Tom Hertel, Alla Golub, and Nelson Villoria

Collaborators: Steven Rose

Development of a dynamic global CGE model (GDyn-E-AEZ) to analyze interactions between energy and climate change policies. The model will include dynamic land allocation, GHG management, energy markets, and unmanaged land access (forest and non-forest). Regional land supply and marginal land productivity for unmanaged land will be econometrically estimated. Resulted model will be used to explore global interactions between regional biofuels and climate policies, exploring the regional, sectoral, and temporal implications for, among other things, land-use, commodity markets, trade, welfare, and policy compliance costs. The research looks for both synergies and competition between policies. Next, the model issued to carry out research on the potential global and regional economic implications of reduced deforestation policies on agriculture. A paper using GDyn-E-AEZ to analyze effects of environmental and energy policies on long run patterns of land is in development for presentation at the Conference in Geneva. Another paper focused on relative agricultural productivity and tropical deforestation developed under this project will be presented at the Conference in Geneva.

Dynamic extension of GTAP-BIO model, US EPA, 2011-2012

Staff: Tom Hertel, Alla Golub, Farzad Taheripour, Uris Baldos

Collaborators: Colleagues at EPA, Robert Beach (RTI), Dileep Birur (RTI)

Development of a dynamic extension of the GTAP-BIO model to asses economic and environmental impacts of biofuels. The model built in the course of this project will assist EPA in its lifecycle assessment of GHG emissions from biofuels. Tasks under this project include refinement of GTAP-BIO v.7 data and development of dynamic version of GTAP-BIO model including further development of the land use module.

Development of GDyn-E model, DOE, 2010-2012

Staff: Tom Hertel and Alla Golub

Collaborators: Liwayway Adkins and Bryan Mignone

Development of a dynamic version of the GTAP-E model to analyze US and global carbon pricing policies. Activities under this work include merge of GTAP-E and GDyn models to produce dynamic energy-environmental GTAP Model called GDyn-E; energy sectors comparison with and calibration to existing DOE energy system modeling tools; use resulted model to evaluate macroeconomic and industrial implications of US carbon pricing policies under different assumptions about international actions. A paper using GDyn-E to analyze sectoral and global implications of the US Clean Energy Standard will be presented at the Conference in Geneva.

Introducing water resources into the GTAP Modeling framework, USDA-DOE, 2009-2012

Staff: *Hertel, Taheripour, and Liu*

Collaborators: *Ximing Cai from UIUC*

This projects aims to distinguish irrigated and rain fed cropland and introduce water resources into GTAP Modeling framework. After a great deal of hard work on the data and modeling fronts, we are finally producing results and the work has been widely presented in several important conferences including: 2011 Applied and Agricultural Economics Association meeting, Pittsburg, Pennsylvania; 14th Annual Conference on Global Economic Analysis, Venice, Italy; 6th Frontiers in Bioenergy US-Brazil Symposium on Sustainable Bioenergy, 2011, West Lafayette, Indiana; Snowmass Conference on Integrated Assessment Modeling, Snowmass, Colorado, 2011; Forestry and Agriculture Greenhouse Gas Modeling Forum, September, 2011, Shepherdstown, West Virginia; and American Geophysical Union 2011, San Francisco, California. By incorporating irrigation explicitly into our analysis, and factoring in recent estimates by the International Water Management Institute of water restrictions, we have greatly improved our understanding of the indirect land use impacts of biofuels. The primary results of this

research are presented in a GTAP working paper (Taheripour, Hertel and Liu, 2011). This working paper is turned into a journal article which is now under review. The latest model developed under this line of research incorporated water as an input into the irrigated crop industries production functions at river basin-AEZ level. The most recent results obtained from this model will be presented at the Conference in Geneva.

Modifications and Expansions in GTAP-BIO model and its land use module, California Air Resources Board and National Biodiesel Board, 2011-2013

Staff: Tyner, Taheripour and Golub

These projects are defined to introduce new biofuel pathways in the GTAP-BIO model and improve its capabilities to provide more accurate estimates for the ILUC due to biofuel production. These projects tend to estimate the parameters of the land use module based on historical observation too. In addition, these projects aim to improve the land use module of the model. Several master and Ph.D. students defined their research projects based on these projects.

Publications

Below is a list of papers in this area that have emerged from the Center over the past year:

Ahmed, S. A., N. Diffenbaugh, T. Hertel, and W. Martin, 2012. "Agriculture and Trade Opportunities for Tanzania: Past Volatility and Future Climate Change", Review of Development Economics.

Avetisyan, M., A. Golub, T.W Hertel, S. Rose and B. Henderson, 2011. "Why a global carbon policy could have a dramatic impact on the pattern of worldwide livestock production", Applied Economics Perspectives and Policy

Beckman, J., T.W. Hertel, and W.E. Tyner, 2011. "Validating Energy-Oriented CGE Models", Energy Economics 33:799-806.

Beckman, J., T. W. Hertel, F. Taheripour and W.E. Tyner, 2011. "Structural Change in the Biofuels Era", European Review of Agricultural Economics.

Diffenbaugh, N.S., T. W. Hertel, M. Scherer, and M. Verma, 2012. "Implications of Climate Volatility for Agricultural Commodity Markets under Alternative Energy Futures", Nature Climate Change April 22.

Golub, A., and T. Hertel. "Modeling Land Use Change Impacts of Biofuels in the GTAP-BIO Framework". *Climate Change Economics.* Forthcoming.

Golub, A., B. Henderson, T. Hertel, P. Gerber, S. Rose and B. Sohngen. "Global Climate Policy Impacts on Livestock, Land Use, Livelihoods and Food Security". *Proceedings of National Academy of Science*. Under third round review.

Golub, A., B. Irfanoglu, and B. Hertel, 2011. "Effects of GHG Mitigation Policies on Livestock Sectors". Draft final report submitted to Food and Agriculture Organization of the United Nations, September.

Golub, A., B. Henderson, and T. Hertel, 2011. "GHG Mitigation Policies in Livestock Sectors: Competitiveness, Emission Leakage and Food Security". Selected Paper, Agricultural and Applied Economics Association Annual Meeting, Pittsburgh, Pennsylvania, USA, July.

Hertel, T., W., 2011. "The Distributional Impacts of Climate Policy: Discussion", B.E. Journal of Economic Analysis and Policy

Hertel, T., W., 2011. "The Global Supply and Demand for Land in 2050: A Perfect Storm?", American Journal of Agricultural Economics 93(2):259-275

Hertel, T. W. and J. Beckman, 2011. "Commodity Price Volatility in the Biofuel Era: An Examination of the Linkage Between Energy and Agricultural Markets", in <u>The Intended and Unintended Effects of U.S. Agricultural and Biotechnology Policies</u>, edited by Joshua Graff Zivin and Jeffrey Perloff, NBER and University of Chicago Press.

O'Hare, M., M. Delucchi, R. Edwards, U. Fritsche, H. Gibbs,T. Hertel, J. Hill, D. Kammen, D. Laborde, L. Marelli, D. Mulligan, R. Plevin and W. Tyner (2011). "Comment on 'Indirect land use change for biofuels: Testing predictions and improving analytical methodologies' by Kim and Dale: statistical reliability and the definition of the indirect land use change (iLUC) issue", <u>Biomass and Bioenergy</u>.

Sarica, K. and W. Tyner, 2011a. *Analysis of U.S. Renewable Fuels Policies Using Modified Markal and Gtap-Bio Models*. in *30th USAEE/IAEE North American Conference*. 2011a. Washington D.C.

Sarica, K. and W. Tyner, 2011b. *Comparison of a Clean Energy Standard and a Carbon Tax*, in *The Allied Social Science Associations Annual Meeting*2011b: Chicago.

Steinbuks, J. 2012. "Interfuel Substitution and Energy Use in the UK Manufacturing Sector," <u>Energy Journal 33(1)</u>: 1-29.

Steinbuks, J, 2011."A Survey of Recent Developments in Energy Demand Modeling", in Jamasb, T. and Pollitt, M., Eds., Electricity and Demand in a Low-Carbon World: Customers, Citizens and Loads, Cambridge University Press: Cambridge UK.

Steinbuks, J.; and Hertel, T, 2011. "The Optimal Allocation of Global Land Use in the Food-Energy-Environment Trilemma". *GTAP Working Paper* No. 64

Stevenson, J.; Byerlee, D.; Villoria, N.B.; Kelley, T.; and Maredia M. "Agricultural technology, global land use and deforestation: A review and new estimates of the impacts of crop research". CGIAR Independent Science and Partnership Council's Standing Panel on Impact Assessment. Green Cover series.

Taheripour, F, T. Hertel, and J. Liu, 2011. "The Role of Irrigation in Determining the Global Land Use Impacts of Biofuels," GTAP working paper no. 65, https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=3743

Taheripour, F., T.W. Hertel and W.E. Tyner, 2011. "Implications of the Biofuels Boom for the Global Livestock Industry: A Computable General Equilibrium Analysis" <u>Agricultural Economics</u>

Taheripour F., W. Tyner, and M. Wang, 2011. "Global land use changes due to the U.S. cellulosic biofuel program simulated with the GTAP Model," Argonne National Laboratory, USA, Available at: http://greet.es.anl.gov/files/luc_ethanol

Taheripour F. and W. Tyner, 2011 "Introducing First and Second Generation Biofuels into GTAP Data Base version 7," GTAP Research Memorandum No. 21

Tyner and Taheripour, 2012, "Land Use Changes and Consequent CO2 Emissions due to US Corn Ethanol Production" in Encyclopedia of Biodiversity, 2nd Edition.

Villoria, N.B. and Hertel, T.W. 2011. "Geography Matters: International Trade Patterns and the Indirect Land Use Effects of Biofuels". *American Journal of Agricultural Economics*. 93(4): 919-935, (Lead article.).

Villoria, N.B., 2011. "Impacts of agricultural research-led productivity on land-use change". For the CGIAR Independent Science & Partnership Council's Standing Panel on Impact Assessment (SPIA) available at http://impact.cgiar.org/, April.

VI.   Education and the Network

New Technical Paper, Working Papers and Research Memoranda

New Technical Papers

GTAP-POV: A Framework for Assessing the National Poverty Impacts of Global Economic and Environmental Policies
by Hertel, Thomas, Monika Verma, Maros Ivanic and Ana R. Rios
Publication: GTAP Technical Paper No. 31
Publication Year: 2011

New Working Papers

The Optimal Allocation of Global Land Use in the Food-Energy-Environment Trilemma
by Steinbuks, Jevgenijs and Thomas Hertel
Publication: GTAP Working Paper No. 64
Publication Year: 2012

The Role of Irrigation in Determining the Global Land Use Impacts of Biofuels
by Taheripour, Farzad, Thomas Hertel and Jing Liu
Publication: GTAP Working Paper No. 65
Publication Year: 2011

Global Applied General Equilibrium Analysis using the GTAP Framework
by Hertel, Thomas
Publication: GTAP Working Paper No. 66
Publication Year: 2012

Research Memoranda

Projections for World CGE Model Baselines
by Chappuis, Thomas and Terrie Walmsley
Publication: GTAP Research Memorandum No. 22
Publication Year: 2011

Education and Courses

The Center continues to re-examine the way in which it educates graduate students, staff, visitors and network members. Demand for our short courses is noticeably lower, particularly for the standard short course, where there are fewer applications. This has not significantly affected our courses. In years where numbers were high, more people were accepted and classes were larger in size. Reduced applications have brought class sizes back down to a more manageable level.

This year we will hold two short courses:

- o The first is the Dynamic course which will be held in Denmark in July. We'd like to thank Hans Jensen for assisting us with brining this course to Denmark and Europe.

- o The second is the standard GTAP short course, which is being hosted by the School of Public Policy at George Mason. We'd like to thank Mary Burfisher for her assistance in organizing this course.

Despite demand for courses being low queries and about GTAP products are high and new members struggle to teach themselves.

Research Fellows

Antoine Bouët will report on the committee's decisions at the Board meeting. The committee includes Antoine Bouët (Committee Chair), Terrie Walmsley, Sergey Paltsev and Martin Banse; with Meghan Alexander and Ginger Batta providing support in the collection of CVs and online voting. The CVs of the research fellows are included in the supplementary material in your folder and are available on the website at:

http://www.gtap.agecon.purdue.edu/events/Board_Meetings/2012/supp_material.asp

Conference Proposals

Geneva 2012

Patrick Low and Roberta Piermartini will welcome us to Geneva and present an update on preparations for the 2012 conference at the board meeting. This event is being hosted by World Trade Organization, International Trade Centre and UN Conference on Trade and Development (UNCTAD) in Geneva, Switzerland.

Shanghai 2013

Xingguo Ye, Shanghai Foreign Institute of Trade; Yihai Li and Shengjia Wang from the Shanghai Social Sciences Academy; and Weiwei Zhang from the Shanghai WTO Affairs Consultation Center will attend the board meeting to update us on the 2013 conference to be held in the Shanghai Foreign Institute of Trade and jointly hosted by the Shanghai WTO Affairs Consultation Center (SCC/WTO) and the Shanghai Academy of Social Sciences (SASS). A copy of the proposal is contained in the supplementary materials on the website at:

https://www.gtap.agecon.purdue.edu/events/Board_Meetings/2012/supp_material.asp

Senegal 2014

In 2011 an email was sent to board members requesting feedback on a proposal to hold the 2014 conference in Dakar, Senegal. The conference would be hosted by IFPRI. At this year's board meeting we will hear more from IFPRI about the proposed conference and we will have an opportunity to vote on the proposal. A copy of the proposal is available at:

https://www.gtap.agecon.purdue.edu/events/Board_Meetings/2012/supp_material.asp

Report on GTAP Usage and the GTAP Website

Ginger Batta has undertaken a number of searches to set up a baseline to document the impact of GTAP. Three sources have been examined:

1) Econlit: AEA's electronic bibliography of economics literature,

2) IDEAS: a freely available, online bibliographic database dedicated to Economics, and

3) Google Scholar: Google's dedicated engine for searching scholarly literature.

This report and the GTAP website report are contained in the supplementary materials provided on the board website.

https://www.gtap.agecon.purdue.edu/events/Board_Meetings/2012/supp_material.asp

VII. Finances, Budgets and Staffing Plan

Budgeting

To be handed out and discussed at the board meeting.

Staffing

Staffing Goal: To actively seek and encourage talented staff and graduate students

Current Staffing Plan and New Staff

No new staff members have been hired this year. We are currently seeking a Research Account Coordinator to join the administrative team and assist with research grants, staff issues (e.g., visas) and finances.

Allocation of Resources over the next year

An overview of how individuals are funded and all the activities they will spend their time over the next 12 months is given below. As you can see, many of the Center's staff are externally funded (i.e. not supported by Consortium funds or Data Base sales.)

Robert McDougall	100% core	Data Base Issues (Taxes, Energy and FIT)	Mentoring of data team	Documentation	Document GTAP-E Model	Research and Courses		
Badri Narayanan	100% core	Oversee release schedule	Website and data documentation	Data Base (Protection, trade, agricultural production targeting and support)	Satellite data schedule	Live sessions and seminars	GTAPAgg and FlexAgg	Research and Courses
Angel Aguiar	100% core	Working with I-O Table contributors	I-O Peer Review Process and documentation	I-O Educational materials	Data Base (Pre-processing of macro data, dwellings, I-O disagg)	Research and Courses		
Terrie Walmsley	100% core	Short Course and education plan	Grad student supervision	Conference and board meeting	GTAP Data Base projects (Skills Data, IRIO)	Satellite data	Research	Strategic Planning
Thomas Hertel	25% core	Assist with Conference	Research	Grad Student Supervision	Satellite data			
Nelson Villoria	50% Projects	Short Course and education plan	International Transportation Data	Grad student supervision	Research			
Alla Golub	100% Projects	Dynamic GTAP-E Model	Energy and Environ research	Satellite data	Grad student supervision	Document GTAP-E Model	Short Courses	
Jevgenijs Steinbuks	100% Projects	Energy and Environ research	Energy Data	Satellite energy data				
Csilla Lakatos	100% USITC	Foreign affiliates model and data	Other USITC projects					
Graduate Students	Various	Macro transition TP	Heterogeneous firms	Data Base (Agr Production Targeting, macro, Elasticities)	Short Courses	Special data Projects (IRIO, Skills)	Research Projects	Satellite data projects (Land use, CO2)
Meghan Alexander	100% core	Conference and course proposals	Board meeting	Marketing plan	Conference logistics	Board meeting logistics	Course logistics	Budgeting and Finances

Ginger Batta	100% core	Website	Conference Program	Data sales and reporting	Course applications	Conference applications		
Research co-ordinator	100% core	Assist with Grants	Budgeting and Finances	Staff visas and employment				

VIII. Appendices

Appendix 1: List of potential issues for the discussion during the session on "Data Base and Research Issues"

It is unlikely that we will have time to discuss all of these, but this is a list of important issues that have come up over the past year and may be of interest to the board.

The GTAP Data Base:
- energy data
- services data
- trade data
- protection data
- Commodity taxes
- Domestic support
- regional disaggregation
- Chopping bloc
- quality comparisons of inputs
- quality comparisons of the final database
- factor splits
- Skill splits
- GTAPAgg
- matching IMF trade totals
- data sourcing
- releasing the database in alternative formats (e.g., Gams)
- sectoral disaggregation
- Peer-review of I-O tables
- data management issues
- multi-year databases

Satellite Data and Programs:
- Inter-regional transfers
- NTMs
- services liberalization and FDI
- TASTE
- Weighting schemes for protection data
- the GTAP Baseline
- CO2 emissions
- Non-CO2 emissions

- Land use data
- GEOSHARE
- parameter estimation

Research and Models:
- Updating the GTAP Model (e.g., Firm heterogeneity)
- GTAP-E and GTAP-E Data Base aggregation program
- Dynamic GTAP Model
- Africa Data Base and modeling
- validation exercises
- terms of trade effects in GTAP
- Technical papers
- Africa Project

Education:
- Further overseas courses
- Data Base courses
- Web courses
- Courses for policy makers
- Demand for courses
- cost of courses
- Graduate students

Network:
- pricing policies
- scholarships
- conferences
- board meetings and membership
- Europe
- Regional GTAP Centers
- Open source
- staffing
- marketing GTAP

Appendix 2: Board Interest Lists

Domestic Support: GTAP Staff - Badri Narayanan Martina Brockmeier, Hans Grinsted Jensen, replacement for Hsin Huang	**Trade data reports:** GTAP Staff - Badri Narayanan Antoine Bouët, Mark Gehlhar, David Laborde, Zhi Wang
ITC-Geneva/CEPII Protection data: GTAP Staff - Badri Narayanan Antoine Bouët, David Laborde, Sébastien Jean, Anders Aeroe, Will Martin, Mondher Mimouni, Hiroaki Kuwahara	**Services trade:** GTAP Staff - Rob McDougall Joe Francois, Hans van Meijl, Patrick Low, Juzhong Zhuang
Taxes: GTAP Staff - Rob McDougall Will Martin, Sergey Paltsev, Norio Nakazawa	**Africa tables:** GTAP Staff - Angel Aguiar FDI Bouët, Stephen Karingi, David Laborde, Will Martin, Joseph Atta-Mensah
Export Taxes: Aziz Elbehri, David Laborde	**I-O tables in general:** GTAP Staff - Angel Aguiar Antoine Bouët, Mark Horridge, Lucian Cernat, Fumihira Nishizaki
EU tables: GTAP Staff - Angel Aguiar Martina Brockmeier, Martin Banse, Marijke Kuiper, Hans Van Meijl, Joe Francois, Lucian Cernat	**Skills data:** GTAP Staff - Terrie Walmsley Bob Koopman, Masakuzi Watanuki, Marinos Tsigas
Macro data: GTAP Staff - Angel Aguiar Liwayway Adkins, Will Martin, Joe Francois	**Elasticities:** GTAP Staff - Badri Narayanan Will Martin
Agricultural disaggregation: GTAP Staff - Badri Narayanan Martina Brockmeier, Marijke Kuiper, Suchada Langley	**International margins:** GTAP Staff - Nelson Villoria Masakuzu Watanuki
Value added in general: GTAP Staff - Badri Narayanan Masakuzu Watanuki	**IRIO**: GTAP Staff - Terrie Walmsley Joe Francois, Zhi Wang, Marinos Tsigas, Mark Gehlhar
Energy data: GTAP Staff - Rob McDougall Liwayway Adkins, Sergey Paltsev, Richard Garbaccio, Hom Pant, Jean Chateau, Richard Tol	**Land use:** GTAP Staff – Nelson Villoria Liwayway Adkins, Sergey Paltsev, Richard Garbaccio, Hom Pant, Jean Chateau, Hans van Meijl, Steve Rose
CO2 emissions: GTAP Staff - Rob McDougall Liwayway Adkins, Sergey Paltsev, Richard Garbaccio, Hom Pant, Jean Chateau, Steve Rose	**Migration:** GTAP Staff - Angel Aguiar Advisory Board - Antoine Bouët, Masakuzi Watanuki, Bryan Roberts
Non-CO2: GTAP Staff - Alla Advisory Board - Liwayway Adkins, Sergey Paltsev, Richard Garbaccio, Hom Pant, Jean Chateau, Steve Rose	**Baseline:** GTAP Staff - Terrie Walmsley Liwayway Adkins, Antoine Bouët, Lionel Fontagné, Jean Chateau
FDI: GTAP Staff - Terrie Walmsley Advisory Board - Antoine Bouët, Patrick Jomini, Robert Koopman, Lucian Cernat	

Appendix 3: Detailed List of Priorities for Future Releases

GTAP 8a Data Base

Details	Responsible staff member
Fix New Headers - Fix needed for tariff components specific v ad valorem tariff revenues and based on GTAP trade	BN
Software issues in v8: - GEMPACK 9 and Sparse Storage (Notify the users about the fix suggested by COPS and Re-do the files using GP 9.00) - CO2 Flexagg issues	BN
Documentation of version 8	BN (RMD,AA etc)

Version 8.1

Details	Responsible staff member
Fix Make issues - Fix the Make issues in the construction programs, e.g. Move the intermediate files used in protection module from "in" to "wrk" folder - Opus Make: Remove reliance on make	BN
Labor Splits - Take Marinos Tsigas data and fill in missing countries - Include in the build	TW (BN, AG)
Energy data - Oil and gas fixes	RMD
New Tariff Data - Errors in protectorates identified by Houssein - Respond to and Implement Antoine's comments - Revised 2004 data - TASTE	BN
Other Protection - Revise 2004 Export subsidies data using the same methodologies as in 2007 data (David Laborde); change 2004 construction programs to match 2007, so we have the same build programs for both	BN (RMD)
CO2 Emissions - GTAP-E model compatible Flexagg - Inclusion of satellite into main build	BN and AG
New IO tables	AA

- African IO tables - Others	
Make available new African GTAP Data Base	BN

Satellite Data

Details	Responsible staff member
Land use - Final version from Uris and Tom expected in June - GTAPAgg - Inclusion of satellite into main build	BN, TH, Uris and NV
Non-CO2 - Get final version from Steve Rose and Amer - GTAPAgg - Inclusion of satellite into main build	BN and AG
GMig2 - Inclusion of satellite into main build - Revisions for GMig2 GDyn	BN and AA
GDyn - Inclusion of satellite into main build	BN
MyGTAP - Current version to board/public - Next steps: Government balance and taxes	TW and ZH
GTAPAgg - How do we treat satellite datasets and model combinations?	BN and MH

Version 9 and beyond

Details	Responsible staff member
I-O Quality - Incorporation of treatment flags - Work with Scott to get EU program released to public	AA
Dwellings Module	AA (RMD)
APT issues - Fix the defects in the current APT build (e.g. using pre-targeted IO tables as input) - Include APT in the construction process to minimize human errors while transferring files	BN (RMD)
FIT Module changes for treatment of taxes & domestic support - Stop removing taxes from IO tables - Target domestic support rates from protection module	RMD
Protection Module - In averaging tariffs over countries, use energy-adjusted country-level trade data. - Remove tariffs on travelers' expenditure (involves protection, energy, FIT and assembly module fixes) - Retain tariffs on zero trade flows - Use RG-weighted tariff for zero & tiny trade flows (for) - Rents on TRQs - Anything else that comes out of review (see board section)	BN (RMD)
IO Agricultural and non-Agricultural disaggregation - Fix previous issues we had for which we had to manually disaggregate some sectors - Revising the agricultural and food dataset by Everett Peterson	BN (AA, RMD)
Energy data - Various Minor fixes	RMD
Times series trade data - issue in Netherlands noted by Glen Peters	BN (Mark Gehlhar)
Services Trade: - AUS-NZL trade issue	RMD
International margins	NV
Documentation of construction process	BN (AA, RMD)
Regional Mappings - France, Finland and Australia – take out protectorates	BN

Sectoral mappings - Update technical paper 1 for new Concordances - Change commodity set labels	AA and BN
Time series - I-O updates - Challenges to comparable inputs for different years - Constant prices	BN
GTAPAgg - Issues with adding extra headers for info only and flexibility with respect to aggregation	BN (AA)
SAM program - Satellites to be included	BN (SMD, TW)

Data Research

Representative IO table - Do we need multiple IO tables representing developed and developing countries?	BN
Comparisons of IO before and after processing - how much did a country's IO table change	AA and TW
Comparisons between releases - Paper and Documentation - release comparison results between public releases (e.g., v7.1 v v8)	BN and RMD
Specific Tariffs Paper - data - model	BN and NV
Domestic margins - IO data - construction process - other implications	