



# **The Global Trade Analysis Project: Issues and Future Directions**

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## **OBJECTIVES, ACTION PLANS AND ACCOMPLISHMENTS**

### **GTAP**

The Center for Global Trade Analysis is the publicly funded, university based home for GTAP (Global Trade Analysis Project), a global network of researchers and policy makers conducting quantitative analysis of international policy issues. Our purpose is to improve the quality of global economy-wide analysis through education and by developing analytical data bases, economic models, and innovative methodologies. Our unique institutional structure enables us to foster collaboration among academia, public and private sectors worldwide.

GTAP comprises:

- \* a fully documented, publicly available data base,
- \* a standard modeling framework and associated software which are well-documented and flexible, and which lend themselves to straightforward replication of analyses by third parties,
- \* a global network of researchers, linked together via email and a Worldwide Web site, and finally,
- \* a Consortium of national and international agencies providing leadership and a base level of support. The vehicle, which has been set up for Consortium members to provide this guidance and direction, is the *GTAP Advisory Board*.

The Board advises the Director on matters of policy, research agenda and funding. In so doing, it helps to set the direction of future developments in the GTAP network, training courses, data base and modeling framework. In keeping with the title of "*advisory board*," responsibility for the final decision in these matters rests with the Director. In this way we hope to keep the project moving ahead on an effective and timely course.

### **Assessment of Action Plan (Goals) for Past Year**

The goals for the past year, as laid out at the 2003 GTAP board meeting, are listed below, along with an assessment of our progress towards accomplishing these goals. (A complete summary of last year's board meeting is available from the consortium page of the GTAP web site):

[http://www.gtap.agecon.purdue.edu/events/Board\\_Meetings/2003/Summary.pdf](http://www.gtap.agecon.purdue.edu/events/Board_Meetings/2003/Summary.pdf)

1. Release the v6.0 GTAP Data Base

Assessment: Getting out a new data base is always a challenge. In part because there are always unforeseen problems and in part because we rely heavily on others for key data contributions. Having made two prereleases already, we are well on the way towards a public release of version 6.0 of the GTAP data base. The final pre-release to the board is expected prior to the board meeting. An outline of the schedule for final public release is provided in Appendix 1.

2. Compare protection data bases from different sources (WITS/TRAINS, CEPII, AMAD) seek to understand their differences, and determine the best approach to characterizing protection in version 6.0 of the GTAP data base.

Assessment: As of April, we now have all the pieces of this puzzle and are in a position to conduct some detailed comparisons. Betina Dimaranan with the assistance of Jason Grant (graduate student) have done a great deal of work comparing the different protection data sources and will be circulating material in the coming month. Several board members are actively engaged in the comparison of protection data as well. These discussions have been placed on the web site which permits interested consortium members to follow the progress in this area.

[http://www.gtap.agecon.purdue.edu/access\\_board/tariff\\_discussion.asp](http://www.gtap.agecon.purdue.edu/access_board/tariff_discussion.asp)

3. Introduce bilateral information on direct trade in services

Assessment: In keeping with the priorities of the board, we have invested considerable time in this area of the data base. One of our graduate students, Jan Hagemeyer, has been working closely with Robert McDougall on this. They have nearly redone the unilateral work, using updated and improved data sources, and are gearing up to address the bilateral trade in services work, which remains a significant challenge. Needless to say, this will not be ready in time for prerelease 3. We do, however, anticipate including this in the first interim release of version 6 (i.e. 6.1).

4. Improve the government accounts in GTAP to permit more accurate treatment of public finance issues.

Assessment: With the assistance of Jan Hagemeyer (graduate student) the first phase of work on the government accounts has been very successful. This includes incorporation of income taxes and factor employment taxes (e.g., payroll taxes). This work will be incorporated into version 6.0 of the GTAP data base. Much more could be done in this area, with additional resources.

5. Produce a prototype version of GTAP with explicit treatment of domestic wholesale/retail/transport margins.

Assessment: Everett Peterson from at VPI University is continuing work on the full-blown GTAP data base with margins included. (Last year he presented the prototype model to the

board.) He will present a summary of his findings on international margins at the GTAP board meeting.

6. Refine and document Dynamic GTAP model in anticipation of a dynamic modeling short course.

Assessment: We are in the process of improving and documenting the Dynamic GTAP model in anticipation of the dynamic modeling short course in October, 2004. Currently we are working on updating the model and data aggregation program; documenting the welfare decomposition, baseline and hands-on; and testing applications to be used in the course. We have also had preliminary discussions with several publishers, who have expressed interest in this book. We hope to submit the completed book to the publisher in 2005.

7. Continue work on parameter estimation and encourage research aimed at model validation

Assessment: Two technical papers have been produced and the results are used in version 6 of the GTAP data base. Riemer and Hertel (working paper 22) provided new income elasticities of demand for the CDE expenditure function. Hertel, Hummels, Ivanic and Keeney (GTAP working paper 26) provided new estimates of the elasticities of substitution amongst imports. Also, Hertel, Keeney and Valenzuela will be presenting a paper on model validation at the Conference.

8. Work on improving quality of primary factor splits.

Assessment: This is largely a question of obtaining better data. In the case of 14 developing countries, we have been able to capitalize on recent household surveys to improve the treatment of returns to self-employed labor (previously included with capital). We hope to extend this work in the coming year and include it in the prerelease stream of version 6. More generally, we need to activate the Working Committee on this topic and solicit more input from the Board members.

9. Improve the coverage of domestic support to separately include the commodities that are currently lumped together under miscellaneous commodities in the OECD PSE tables.

Assessment: Some progress has been made towards this goal. 2001 domestic support data, contributed by Hsin Huang of the OECD and by Hans Grinsted Jensen of the FOI, were incorporated into version 6.0 of the GTAP Data Base for the OECD and some non-OECD member countries. Hans Jensen provided data for the GTAP commodities lumped together under miscellaneous commodities -- fruits and vegetables, plant-based fibers and other crops -- in his disaggregation of domestic support for the EU member countries. A parallel treatment was given to the non-EU OECD countries by assigning the average domestic support reported for miscellaneous commodities to the three GTAP commodities above. This may be revised should improved data become available from the OECD.

10. Continue to improve communications with national I-O data base contributors

Assessment: Most of the outline of communications with contributors set out at the last board meeting (updated in Appendix 2) has been implemented and is working well. Reports on each of the newly contributed I-O tables now accompany documentation of the I-O tables released to the board. We are currently working on making the check and entropy programs available in a user friendly format to contributors via the web (some of the check programs/tab files are already available on the web).

11. Conduct a feasibility study on the cost of bringing the IFPRI/UNDP social accounting matrices for Latin American into the GTAP data base. Then attempt to find funding to bring them into v6.0.

Assessment: Some progress has been made on this goal. A list of countries has been obtained and a proposal is currently being written which we hope to present to interested parties at the upcoming Board meeting.

12. Continue to work on a GTAP baseline

Assessment: Changes to the GTAP baseline have been minimal. New forecasts have not become available so no updates have been undertaken. Alternative sources of labor forecasts are currently being explored. The OECD is also putting together a workshop in late June to look at issues with developing a baseline. We hope to hear about this at the upcoming Board meeting.

13. Encourage submission of a GTAP technical paper on the topic of adjustment costs

Assessment: No progress to date.

14. Go through strategic planning process at the Center

Assessment: The Center contracted Sandra Rivera, currently on leave from the US International Trade Commission, to lead this project. In February the first GTAP survey was conducted. The survey had a 40% response rate, with over 850 people from 89 countries responding. In March 2004, the Center underwent an intensive retreat to examine their mission, vision, and goals and strategies for the next 10 years. The retreat was preceded by a board survey. A copy of the strategic plan is provided in Appendix 3.

15. Organize 7th Annual Conference on Global Economic Analysis to be held in Washington D.C. in June 2004

Assessment: It looks like we are on track for another very successful conference. The program committee has lined up a good group of speakers for the plenary and policy panels. We have a record number of abstracts submitted, and we are experimenting with featured sessions and discussants.

16. Hold annual GTAP short course in Purdue in August 2003

Assessment: The short course held in Purdue in August 2003 was a success. In addition, we are offering a short course in Buenos Aires in May 2004. This is sponsored by the IDB. The Center would like to hold more courses overseas. With over 50 applications for 24 places in the South American course, the region's demand seems high. However, it is imperative that the high quality people have come to expect from the GTAP short courses be maintained.

## **STRATEGIC PLAN**

### **Background**

One outcome of the 2003 Board Meeting was for the Center to undertake a strategic planning exercise. The Board provided some valuable input and ideas about how to proceed with this activity. After 10 years of relying on one person to think strategically on all issues, this year, the Center has systematically undertaken a comprehensive strategic planning process with Sandra Rivera leading the effort. Terrie Walmsley and Wally Tyner were also instrumental in getting this product to the finish line and making the process a success.

We began with conducting research, at the micro level, both internally and externally. The first step included conducting in-depth interviews with every full time staff member and graduate student to understand perspectives on past work, present best products, market conditions, best practices, current concerns and hopes and fears for the future. Conducted in January and February, insights gathered provided the basis for strategic thinking. The second step was to design and execute a broad based GTAP-L web based survey posted in late February. The third step was to include the Advisory Board in the in-depth interview process, formally through an on-line survey. Most (17 of 23) board members made time to share their insights with the strategic planning team and this feedback was directly used during the Strategic Planning retreat.

The web based survey provided the Center the first comprehensive look at their client base, and a necessary examination of customer satisfaction, frustration and future expectation. With a 41 percent response rate (almost four times the industry average), we now better understand the concerns of our constituencies. The world coverage was impressive: 89 countries were represented in the almost 900 responses, 86 percent of which were from outside the consortium member organizations. Several themes consistently come up from the broad based questions including the importance of including environment in the data base (almost 16 percent of respondents) and supporting GAMS for GTAP and other model users.

The results from the in-depth interviews, board survey and broad-based survey gave Center staff the background and depth they needed from their constituencies to move forward during the Strategic planning retreat (March 28-30, Indianapolis IN). Facilitated by Dr. Janet Ayres, a professor of leadership in the Department of Agricultural Economics, the retreat provided an insulated time to focus on where we wanted to be over the next 10 years.

After 3 days of intensive work, and several follow up meetings, the Center now has a draft mission statement, core values and beliefs, and vision statement. The mission statement clarifies the core purpose of the organization or why it exists. All strategic objectives, measures and initiatives need to link up to the mission. Core values explicitly state the timeless principles that guide the Center. These values represent the deeply held beliefs within the Center and that are demonstrated through the day-to-day behavior of staff and graduate students. The vision provides a word picture of what the Center intends to become. In addition, it signifies the critical transition from the unwavering mission and core values to the dynamic world of strategy. Below are the consensus drafts as they are to date:

## **Mission, Core Values and Vision**

(1.5 pages)

### ***Mission- Why we exist***

[v. 04/25/04]

The Center for Global Trade Analysis is the publicly funded, university based home for GTAP (Global Trade Analysis Project), a global network of researchers and policy makers conducting quantitative analysis of international policy issues. Our purpose is to improve the quality of global economy-wide analysis through education and by developing analytical data bases, economic models, and innovative methodologies. Our unique institutional structure enables us to foster collaboration among academia, public and private sectors worldwide.

### ***Core Values and Beliefs – What will never Change***

#### **We value:**

1. **International Collaboration** because it increases quality of data and analysis
2. **Objectivity and transparency** because they are crucial to our data work and analysis
3. **Discovery** because improving techniques leads to better policy analysis
4. **Learning** because it creates critical vibrancy both within the Center and the expanding network
5. **Engagement** because it helps us serve policy analysts and decision makers with better data and analysis

#### **We believe that:**

1. Better data leads to better policy analysis, which leads to better policy.
2. Reconciling data make data better.
3. CGE modeling can provide useful insights.
4. Avoiding duplication in data production is efficient.
5. Collaboration enhances individual efforts.
6. Having more trained users enriches the policy debate.

### ***Vision – Where we want to go***

[v. 04/25/04]

GTAP is the most vibrant network of global economic policy analysts, with more

than 10,000 individuals making contributions from all over the world. GTAP-based results are influential among decision makers and, after 10 years of intensive model validation efforts, GTAP-based models are widely accepted in the professional literature. The GTAP data base remains at the core of the Project. The open-source institutional arrangement by which the data base is now assembled has spawned rapid growth in the number of data base contributors and collaborators, with contributors in more than 100 countries. The GTAP data base and models are used in research centers throughout the world, leading to ever greater transparency in global economic analysis. Half of our courses are now conducted in developing countries. The 50 consortium members meet regularly through teleconferences to contribute ideas and to help keep the Center's efforts focused on our vision.

## **Goals and Strategies to reach them**

**Goal 1: To actively participate in quantitative economic analysis of pressing global concerns related to the analysis of multilateral and bilateral trade agreements, global environmental issues, and the field of trade and poverty.**

### **Multilateral and bilateral trade agreements**

1. Further develop the Dynamic GTAP model.
2. Improve treatment of trade preferences and their utilization.
3. Enhance analysis of trade agreements' treatment of foreign investment in services.
4. Enhance analysis of labor migration.

### **Global environmental issues**

1. Enable integrated assessment of climate change mitigation policies in a comparative static setting.
2. Develop a dynamic framework that characterizes forestry, by vintage, management type, sequestration potential.
3. Develop an IPCC-consistent emissions baseline.

### **Becoming a leader in the field of trade and poverty**

1. Enable household-disaggregated analysis within the GTAP framework.
- a2. Encourage network members to contribute household surveys to the GTAP data base, and conduct trade/poverty analysis for their respective economies.

## **Goal 2: To improve data products**

1. Improve data quality and user service.
2. Improve data procurement.
3. Improve data development efficiency and quality by distributing a data construction program.
4. Expand scope of database.
5. Improve marketing of database.

## **Goal 3: To purposefully expand and improve education of GTAP globally (in/outside network)**

1. Promote learning among data base contributors.
2. Use workshops and web-based products to provide specialized learning.
3. Improve communication, learning, and transfer of knowledge within the Center.
4. Marketing of GTAP courses.

## **Goal 4: To improve understanding and credibility of the GTAP models**

1. Enhance validation of the GTAP models.
2. Further enhance the ability of users to understand and explain model results.

## **Goal 5: To increase effective participation in the global network, particularly in developing countries**

1. Obtain funding from donor agencies for developing country participants.
2. Conduct more courses and conferences in developing countries.
3. Review pricing to enable greater developing country participation participation.
4. Foster communication within the GTAP network and beyond.
5. Enhance visiting scholar activities.

### **Action Plans for Forthcoming Year**

Following the success of our strategic plan the following is a preliminary list of action plans for the forthcoming year:

1. Release the v6.0 GTAP Data Base and documentation
2. Improve quality of I-O tables by reviewing current data to determine which countries are missing or in greatest need of updating and seek out potential contributors and/or funding
3. Continue to improve communications with national I-O data base contributors through the creation of user friendly check programs and making the SAM aggregation program and technical paper more widely available
4. Incorporate the IFPRI/UNDP social accounting matrices for Latin American into the GTAP data base v6.1.
5. Establish a reporting system for examining and improving the quality of the international datasets in the GTAP data base
6. Examine possibilities for collaboration between FAO and GTAP.
7. Work on improving quality of primary factor splits.
8. Continue work on parameter estimation and encourage research aimed at model validation
9. Continue to examine the incorporation of the explicit treatment of domestic wholesale/retail/transport margins into GTAP model and data base
10. Continue to refine and document Dynamic GTAP model in anticipation of a dynamic modeling short course.
11. Continue to work on a GTAP baseline
12. Technical paper on services liberalization and board access to bilateral FDI data.
13. Encourage submission of a GTAP technical paper on the topic of adjustment costs

14. Improve marketing of GTAP products through brochures, WWW and review of pricing policies
15. Investigate ways in which GTAP can reach out to individuals in developing economies through course, conferences and funding.
16. Organize 7th annual conference on Global Economic Analysis to be held in Washington D.C. in June 2004
17. Hold annual GTAP short course in Purdue in August 2004
18. Hold Dynamic GTAP short course in Purdue in October 2004
19. Examine possibility of holding GTAP/GAMS courses.

## **DATA BASE DEVELOPMENT**

### **Data Base Management**

The data base management approach that was developed and implemented by Robert McDougall and Betina Dimaranan in the construction of the GTAP 5.0 data base continues to guide the team in working towards the GTAP 6.0 data base. The key principles are as follows:

1. Archiving of previous versions and replication of data bases: With the increasing frequency of data base releases and the increasing complexity of data base construction, it is key to be able to reconstruct earlier versions of the data base and to identify and explain differences. This capability is ensured with the system of archiving data base inputs and programs developed by Dimaranan and McDougall.

2. Two tracks for data base development: Pre-releases of the GTAP data base were introduced in constructing the GTAP 5.0 data base to provide GTAP consortium members with the opportunity to evaluate and use the data base as significant improvements, e.g. introduction of updated international source data, become available. After the public release of the GTAP 5.0 data base, interim releases were produced and made available to the consortium member agencies to provide a vehicle for incorporating new or improved input-output tables following the major data base release. Thus, interim releases 5.1, 5.2, and 5.3 were the same as 5.0 except for adjustments or updates on the I-O tables of existing regions (agricultural production targeting for the EU, updated tables for Southeast Asian countries) or the introduction of new regions (CEECs, Russia, and Albania). Interim release 5.4 is similar to 5.3, but incorporates various small bug fixes.

The cycle for a data base with a new reference year (2001) began with the GTAP 6.0 pre-release 1 data base. The pre-release series incorporates new domestic and international source data as well as improved data base construction procedures. Data for 2001 on

macroeconomic aggregates, bilateral trade, agricultural export subsidies, domestic support, and tariff protection were incorporated in pre-release 1. Pre-release 2 included new and improved I-O tables for 11 regions, adjusted I-O tables for 25 EU and CEEC countries, improved trade elasticity estimates, improved demand parameter estimates, and revised procedures in the treatment of macroeconomic aggregates, domestic support, and composite regions. We anticipate relaxing the interim release series to allow not only for new and updated national source data but also to incorporate improvements in the international source data and construction procedures while maintaining the same GTAP 6.0 2001 reference year.

3. Regional Flexibility: All of the GTAP international source data are maintained at the level of more than 200 “standard countries”. This facilitates regional flexibility whereby new regions can be added with a relatively modest amount of work thus allowing for more frequent data base releases. With Everett Peterson, we are revising the procedure for disaggregating agricultural sectors to allow automatic disaggregation of arbitrary regions.

4. Sustainable data sources: The potentially more sustainable sources of both domestic and international datasets are identified and pursued. In the work towards the GTAP 6.0 data base, this is seen in the sourcing of the energy data from the IEA, the domestic support data from the OECD, and services trade data from the IMF and the OECD. This will be explored for other aspects of the data base such as the agricultural input-output estimates and protection data.

5. Data base dissemination through the GTAP website: Pre-releases and interim releases are made available only to the GTAP consortium member agencies and data base contributors. In the past, the pre-releases of the GTAP 5.0 data base were disseminated through the now defunct GTAP web board and the initial interim releases were made available through a secure section of the GTAP FTP site. In the past year, starting with interim release 5.3, the data releases have now been made available in secure pages of the GTAP website which can be accessed only by board member agency representatives and by data base contributors. Preliminary documentation of the data releases accompanies the GTAPagg and FlexAgg data packages. The advisory board member pages on the website now include a repository of input-output tables and of previous data releases as well as materials related to key topics such as the tariff data.

## **Individual Region Data Bases**

*A bit of history for the newcomers:* The GTAP data base consists of bilateral trade, transport, and protection matrices that link individual country/regional economic data bases. The regional data bases are derived from individual country input-output tables, from varying years. Version 1 of the GTAP data base relied exclusively on I-O tables inherited from the Australian Industry Commission's SALTER project. For this reason, GTAP adopted the SALTER concordance that identified 37 sectors/commodities. In the version 3 data base, 11 of the national data bases still traced their roots back to the Industry Commission's SALTER project. (Of course they were updated for each new release using

the FIT program.) These I-O tables were heavily concentrated in the Pacific Rim, reflecting SALTER's focus on APEC issues. Six of these were updated in version 4 (New Zealand, China, Indonesia, Thailand, Taiwan, and Canada). This left old I-O tables only for Japan, Korea, Malaysia, Philippines, Singapore, and Hong Kong. Version 5 updated both Japan and Korea, and Malaysia, Philippines, and Singapore (along with Indonesia and Thailand) were updated in version 5.3, based on data from the Institute for Developing Economies (IDE) in Japan. This leaves Hong Kong as the last remaining I-O table inherited from SALTER. Since there is no actual I-O table in existence for Hong Kong, this had to be “fabricated” by SALTER staff. We may wish to contemplate a change in the treatment of Hong Kong in the future – possibly re-estimating this I-O table, or eventually combining Hong Kong with China. Input from the board on this issue would be welcome.

In addition to these updates of the original SALTER I-O tables, version 4 featured updates of four more existing regional data bases, as well as entirely new data bases for 14 countries (Vietnam, Sri Lanka, Venezuela, Colombia, Uruguay, UK, Germany, Denmark, Sweden, Finland, rest of EU, Turkey, Morocco and South Africa). Version 5 updated 16 national data bases (Australia, China, Japan, Korea, Taiwan, Vietnam, India, Colombia, United States, United Kingdom,) and added 23 more countries. Interim releases of version 5 have added 13 more countries in Central and Eastern Europe (including Russia).

**Version 6:** In version 6, 2 new countries will be added, Madagascar (pre-release 2) and Tunisia (pre-release 3), and at least 10 other I-O tables will be updated (Australia, New Zealand, Singapore, India, Colombia, Brazil, Korea, The Netherlands, Turkey and Taiwan)<sup>1</sup>. All of these updated I-O tables are significant improvements on previous contributions in terms of a more recent I-O table being used or in the case of Singapore additional external data being used to disaggregate. A report on each of these new I-O tables, including the results of the GTAP checking procedures can be found on the web site:

[http://www.gtap.agecon.purdue.edu/access\\_board/IO\\_reports.asp](http://www.gtap.agecon.purdue.edu/access_board/IO_reports.asp)

The complete current list of I-O tables used in GTAP is provided in Appendix 4. With the exception of the IDE tables, these are all available to consortium members on the GTAP web site.

The remaining 18 regions in the 87 region, version 6.0 data base are made up of composite data bases representing groups of countries. In light of recent requests, the number of composite regions was increased in version 6 to allow for more accurate analysis of regional free trade agreements. As a result, the 10 old composite regions have been subdivided into 18 new composite regions. The new composite regions are also listed in Appendix 4.

The I-O tables (or simplified social accounting matrices) for these *composite regions* are based on subsets of the 70 original data bases and a one-to-one mapping between these individual regions and those countries in each of the composite regions. As new I-O tables

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<sup>1</sup> The I-O tables for the USA and Japan may also be updated.

have been added to the data base, the economic size of these composite regions has rapidly diminished, and our ability to match up with the unknown countries has simultaneously improved. During the strategic planning exercise, the possibility of constructing a data base which does not have composite regions but instead incorporates all GTAP standard countries was discussed.

**Contributors:** There are essentially two ways that we have for renewing country data bases and adding new ones. The first method is for individual contributors to step forward and offer a GTAP-ready data base. This has been the predominant vehicle in the past. There are basically three incentives for contributing to this public good: (1) this assures the user that they have the best available national data for their own country in any GTAP applications undertaken; (2) contributors receive a free copy of the final data base, as well as the pre-release, and all future interim releases related to the version to which they contribute (The center has produced a short description of GTAP's Policy on I-O Table and Data Contributors which is given in Appendix 5); and (3) it's the right thing to do. (There are still some idealists out there!) These individual contributions are sometimes simply one-off exercises that are not repeated. However, in many cases, once we have an established relationship with a contributor, they will update their contribution as new data become available. In some cases, these individuals have obtained support from interested Consortium members. For example, the US ITC assisted a group of economists at Moscow State University with the assembly of an I-O table for Russia.

The second vehicle for obtaining new data bases is through special projects, aimed to support some particular line of research or policy analysis. In version 5 we saw a significant increase in the number of these types of special projects, with the incorporation of 15 EU countries (LEI and EU Commission); 13 Central and Eastern European countries (Martin Banse and EU Commission); 7 Southern African countries (Mark Horridge, DFID and IFPRI); and Albania (Mark Horridge and US Department of Commerce). Although this vehicle is less likely to lead to an established relationship and regular updates, it is an important way of making significant improvements to the quality and coverage of the GTAP Data Base.

Contributing an I-O table in the required GTAP format is not an easy task. GTAP continues to emphasize its role as an assembler of data rather than a procurer of data. However, in order to continue to update and expand the regional coverage of the GTAP data base through quality contributions of regional I-O tables, further efforts need to be undertaken to assist contributors. Such efforts could include email lists, workshops and/or funding for those regions where coverage is sparse or current I-O tables are in need of updating. In version 6.1 we hope to be able to fund the incorporation of the IFPRI/UNDP social accounting matrices for Latin American into the GTAP data base.

**Quality assurance:** The board gave quite a unified message to the GTAP staff at the 2002 and 2003 board meetings – focus efforts in version 6 on improving the quality of the domestic components of the GTAP data base. Our quest to improve the quality of the national data bases therefore continues.

Improving the quality of the national data bases has therefore proceeded along two lines. Firstly, an information-theoretic measure of the extent to which FIT alters the domestic data bases is now computed and distributed to the board and contributors with each release (or pre-release). At last years meeting, Robert McDougall provided a national-level summary of these statistics to the board. The results were found to be generally quite sensible, with those economies represented by outdated I-O tables, or as composite regions, and those economies with extensive re-exports requiring the greatest amount of change in FIT. These statistics are now available as part of the release notes on the web for pre-release 2 at:

[http://www.gtap.agecon.purdue.edu/access\\_board/pre\\_rel\\_6p2.asp](http://www.gtap.agecon.purdue.edu/access_board/pre_rel_6p2.asp)

Secondly, improvements have been made to the Center's dealings with I-O contributors. Many of the changes in the Center's communications with I-O contributors, outlined at last year's board meeting have now been implemented. When an I-O table is contributed, a report is compiled on each of the newly contributed I-O tables. The report outlines some basic facts about the data, lists how this contribution improves on any previous contribution, outlines the results of the checking procedures, and provides a list of the 'top 30' differences between this I-O table and the "representative table". (The latter refers to an average of all the fully disaggregated, contribution IO tables.) The 'top 30' differences are obtained using an entropy theoretic measure of the difference. This procedure is now outlined in a paper which will be posted shortly as GTAP working Paper (No. 31). The check programs (tab files) are currently available to contributors on the web, however, we hope to make these programs available in a more user friendly format in 2005. Once the contributed table has been used in constructing the GTAP data base, I-O contributors are also given access to the FIT statistics described above.

Some progress has also been made towards obtaining a method for extracting SAMs from the GTAP data base so that contributors can see their data in a familiar format. A SAM extraction program and technical paper produced by Scott McDonald and Karen Theirfelder has recently been reviewed and it is hoped that we will be able to supply data to contributors in this format. This program is available to board members on the web site. We would be interested in knowing what the board members think of this program and how important it is to them.

<http://www.gtap.agecon.purdue.edu/databases/projects/sams/default.asp>

## **Government Consumption Expenditure**

In earlier GTAP versions, we found that some of the largest discrepancies in the I-O data arose in government consumption expenditure. Different source tables use different conventions, and not all contributors succeeded in adapting non-standard treatments. Since we use World Bank macro data to control the macro expenditure level, no problems appeared at the macro level; but at the sectoral level, the commodity composition of government expenditure in some countries was highly implausible.

For release 6, we (Robert McDougall, Vitaly Kharitonov) have added a new module to the construction program, to identify I-O tables with non-compliant government consumption treatments and address their problems before fitting. We use time series GDP and government consumption expenditure data from the IMF International Financial Statistics data set to identify non-compliant tables and correct the macro expenditure level, and the “representative table” discussed above to correct the commodity composition.

### **Agricultural Disaggregation**

Thanks to Everett Peterson, we have had since GTAP 4 the facility to disaggregate agricultural and food processing sectors in selected I-O tables, using primarily price and supply utilization data from the FAO. This has been a critical factor in expanding the country coverage while maintaining a relatively high level of agricultural detail. But it had an important limitation, that it covered only a fixed set of countries, so that the addition of new regions was liable to require new requests to Everett. Everett has now developed his programs to the point where they can generate estimates for new countries automatically. By applying econometric estimators developed by Everett to current FAO data, from release 6 onward we should be able apply agricultural disaggregation to newly contributed I-O tables as required.

At the time of writing, we are still working to adapt Everett's new program and our I-O disaggregation module to each other. This will remove the most important remaining obstacle to complete achievement of the regional flexibility objective.

### **Bilateral Trade Data**

*Merchandise trade:* The bilateral merchandise trade data linking the regional data bases in GTAP comes from the Statistical Office of the United Nations. These data are ideal for our purposes, but their reliability is questionable. What exporters report as going to importers rarely coincides with importers' documentation of the same bilateral flow. Mark Gehlhar, at ERS/USDA, has developed a set of procedures for reconciling discrepant trade statistics and producing balanced bilateral trade and transport matrices and he is the source of all of these data used in the GTAP data base. In addition to quality control, obtaining all of the trade data from one source assures us of consistency in procedures. Furthermore, as ERS/USDA continues to invest in improvements in these basic procedures, the GTAP data base will be able to capitalize on them. Mark's version 6 work closely parallels that for versions 3, 4, and 5, with some refinements in the treatment of re-exports. His general approach is documented in GTAP Technical Paper #10.

*Trade in Services:* Data sources for trade in services, traditionally weak, are now becoming stronger. For versions 3 and 4 we used Michigan model data, donated kindly by the Michigan team, but in many ways unsuitable to our purpose. For version 5 we used unpublished IMF Balance of Payments (*BOP*) data supplied by courtesy of the UNCTAD. There now exist two useful public collections: the IMF Balance of Payments dataset now covers services trade at a detailed sectoral level, though without a bilateral dimension; and the OECD publishes bilateral services estimates, though with little sectoral detail.

At the time of writing, we (Robert McDougall, Jan Hagemeyer) have made substantial progress toward a new services dataset based on published IMF BOP data. We have in hand a dataset in which values missing in the BOP data are filled in taking account of earlier observations for the same series and time trends observable in other series. From this we aim to obtain for version 6 a services trade dataset similar in structure to that used in version 5, but of better quality, both because of better source data and because of better techniques in filling in missing data. This is the first time we have had an ongoing source for services trade, so it constitutes a significant advance in the sustainability of the GTAP database.

For some time now there has been a desire by many stakeholders (and of course by ourselves) for genuine bilateral content in the services trade data. The OECD publication (*OECD Statistics on International Trade in Services: Detailed Tables by Partner Country*) provides suitable source data. We have begun work to that end; at the time of writing, however, this is still in the exploratory phase. As resources permit, we aim to construct and exploit a GTAP-ready bilateral dataset, using and extending the techniques employed in filling in the BOP data.

Areas of continuing weakness are in international margins, where we continue to use modal shares estimates for US routes only to estimate modal shares for all routes; and travelers' expenditures, where we lack statistical backing for the commodity breakdown.

## **Protection Data**

*Non-agricultural merchandise tariffs:* This is an area where great strides are being made. The fundamental source for the applied tariff data has long been the UNCTAD TRAINS data base. The WTO is also an important source of information on tariff bindings. In addition, there are numerous regional initiatives aimed at the collection of tariff data, such as the work of the Inter-American Development Bank in Latin America. The problem has been one of organizing these data, converting specific tariffs to *ad valorem* rates and aggregating them over commodities and countries. This is particularly challenging in light of the preferential arrangements that have proliferated over the past decade in the wake of the rapidly growing number of free trade agreements. The significant progress that has been made in the past two years has related to this processing of the tariff data.

The version 5 tariff data were based on an early version of the WITS system, undertaken as a joint UNCTAD/World Bank effort. At the time, it was not possible to obtain preferences in the context of aggregated tariff data. Since then, WITS has improved its handling of tariff preferences and GTAP obtained alternative 1997 protection data reflecting the inclusion of such preferences in early 2002. Betina Dimaranan circulated some comparisons of the GTAP-level MFN-applied tariffs and the preference-laden tariffs. The main question identified then has been one of scope, i.e. the preliminary dataset reflected a very limited coverage of preferences.

CEPII and the ITC in Geneva have made considerable improvements in a parallel effort aimed at making widely available tariff data. In their Market Access Maps (MAcMaps) data base, special attention is focused on the conversion of specific tariffs, inclusion of anti-dumping duties, and alternative methods of tariff aggregation that avoid the biases of standard trade-weighted averages. The MAcMaps team has continued to provide GTAP with improved versions of the MAcMaps database since their first contribution of a GTAP aggregation of preliminary 1997 tariffs and anti-dumping duties in mid-2002.

In the construction of GTAP 6 pre-release 1, we incorporated the beta version of the MAcMap 2001 tariff dataset, the tariff data that we had on hand. Although Map\_2001\_beta separately provided data on ad valorem tariffs, ad valorem equivalents (AVE) of specific tariffs, tariff quotas and anti-dumping duties, only the combined data on ad valorem tariffs and the AVE of specific tariffs were used to represent GTAP tariff data. Since the bilateral tariff data reports preferential rates, the usual approach of zeroing our data for known customs unions was not followed. The 2001 MAcMap tariff data was also used for agricultural tariffs instead of applying the 1997 agricultural tariff data.

A significant amount of discussion about the tariff data ensued after the release of the GTAP 6.0 pre-release 1 data base. Trade liberalization between 1997 and 2001, the addition of preferences, and the non-inclusion of TRQs were offered as reasons for the substantially lower tariffs in the pre-release 1 2001 data base compared to the GTAP 5 1997 data base. There was also some discussion of the MAcMap methodology and the ways that it can be improved. A summary of the discussion, e-mails, and materials related to the tariff data are available at:

[http://www.gtap.agecon.purdue.edu/access\\_board/tariff\\_discussion.asp](http://www.gtap.agecon.purdue.edu/access_board/tariff_discussion.asp)

Since the GTAP 6 pre-release 1 data base, the Center has received a tariff dataset from UNCTAD, a revised version of the MAcMap dataset, and a preliminary agricultural tariff dataset (more on the later in the next section). The tariff dataset from UNCTAD was provided at the GTAP region and sector level and included the weighted averages of applied rates for 2001 or the nearest available year. AVEs are included for the main markets -- EU countries, Norway, Switzerland, Japan, United States, and Canada.

The revised version of the MAcMap dataset, MAcMap\_2001, was provided at the country level and disaggregated into MFN rates, preferential rates, and quota rates for both ad valorem and AVE tariffs. The CEPII/ITC revised their procedure for calculating AVEs, the treatment of TRQs, and their aggregation procedure since the last version of MAcMap that was used in GTAP 6 pre-release 1. Preliminary documentation about the MAcMap dataset is available at:

<http://www.cepii.fr/anglaisgraph/bdd/macmap.htm>

With two alternative sources of merchandise tariff data, it was determined by the GTAP center and the advisory board in two previous board meetings that an evaluation and comparison of the tariff data bases has to be made prior to inclusion of the final tariff data

base in the GTAP 6.0 data base. At the time of this writing, the Center is making steps towards such an evaluation by making available pre-processed, GTAP-level versions of the available datasets in order to solicit comments from interested advisory board members and to involve them in the evaluation process. Summary tariff data files and the state of play in the tariff data comparisons are available at:

[http://www.gtap.agecon.purdue.edu/access\\_board/tariff\\_comparison.asp](http://www.gtap.agecon.purdue.edu/access_board/tariff_comparison.asp)

In evaluating and comparing the tariff datasets, we will take into account the following factors: sources of raw data, country coverage, coverage of preferences, breakdown of tariff instruments, aggregation methodology, quality of documentation, responsiveness of data contributor, reliability of data contributor as supplier of data. The selected tariff database will be included in GTAP 6.0 pre-release 3 data base which is expected to be available just right before the advisory board meeting.

*Agricultural Tariffs:* Due to the prevalence of specific and compound tariffs in agriculture, as well as the widespread use of tariff rate quotas (TRQs), the compilation of a tariff data base for agriculture requires special attention. Fortunately a consortium of national and international agencies was formed to address this issue. This group includes three of our consortium members: ERS, OECD, and UNCTAD, and their product is called the Agricultural Market Access Database (AMAD). (More information is available at: <http://www.amad.org>.) It provides tariff data for food and agricultural commodities for all of the major trading partners in the world. In version 5, data based on AMAD were used in preference to the merchandise data sourced directly from WITS. One of the issues under consideration is whether to continue to source these data from AMAD. To facilitate such an evaluation, the associated data for 2001 have been requested from Paul Gibson at ERS.

The Center received an agricultural tariff dataset from Paul Gibson in early April. It is a provisional dataset for which Paul Gibson seeks comments on the data and methodology. The agricultural tariff data is at the tariff line level and includes both bound and applied rates. We will process this dataset and aggregate it to the level of GTAP agricultural sectors and regions to compare it with agricultural tariff data from the alternative data sources (MAcMap and UNCTAD). GTAP is hosting the source data on the GTAP website and is making it available to the GTAP consortium members for comments and evaluation at:

[http://www.gtap.agecon.purdue.edu/access\\_board/AgProt.asp](http://www.gtap.agecon.purdue.edu/access_board/AgProt.asp)

*Agricultural Support:* Accurate assessment of the economic effects of agricultural support remains a specialized task requiring careful treatment, lots of data and good judgment. This has become more challenging as countries have sought to “de-couple” their agricultural support by shifting the emphasis from output subsidies to payments based on historical production as well as payments based on planted acreage and livestock numbers. It has been suggested that compared to GTAP 5, the land subsidies for the US and EU must be treated in a more balanced fashion when they are made independently of the crop planted (i.e. the *ad valorem* rate must be equal across all uses qualifying for payments). Beyond this

adjustment, there is a great deal of scope for refinement, but this becomes controversial and we are inclined to leave such adjustments to individual researchers and agencies working on agricultural policy.

In a pilot study (see GTAP Working Paper #19), Dimaranan, Hertel and Keeney fixed the treatment of historical payments paid to land to better reflect their decoupled nature. A similar approach has not yet been implemented on the GTAP data base because of the changes in the GTAP model that will be necessary in order to take advantage of the change in the data structure.

Domestic support data for 2001 for the OECD member countries was contributed by Hsin Huang from the OECD PSE/CSE data base and incorporated in GTAP 6 pre-release 1. Disaggregated domestic support data for the EU member countries was calculated and contributed by Hans Grinsted Jensen of FOI. Hans includes and disaggregation of support for the agricultural commodities which are usually aggregated under the “miscellaneous category in the OECD PSE/CSE data base. In the GTAP 6 pre-release 2 data base, we implemented a similar treatment for the non-EU OECD countries by assigning then average domestic support reported to “Miscellaneous Commodities’ to the following GTAP sectors: fruits and vegetables (v\_f), plant-based fibers (pfb) and other crops (ocr). Domestic support for the non-OECD CEEC member economies was also incorporated in the GTAP 6 pre-release 2 data base.

*Textiles and Apparel Quotas:* The quota rents (export tax equivalents) associated with textile and apparel quotas in version 5 are based on the work of Joseph Francois and Dean Spinanger, drawing in detailed industry data, interviews and observations on quota rents for selected countries. This is a difficult issue due to the volatility of these quota rents and due to the fact that most of them are unobserved. We hope that Joe and Dean can provide the Center with updated information for the GTAP 6 data base. In the absence of updated data, we plan to replace the 1997 estimates with zeroes. Interested users may then employ the *Altntax* facility in to incorporate revised estimates when they become available.

*Barriers to Services Trade:* Finally, there is the question of barriers to services trade. These flows are becoming an ever more important feature of global trade. Furthermore, there is a perception that barriers in this sector are much larger than in merchandise trade. Therefore, omission of these barriers in our analyses has severe consequences for the analysis of changes in allocative efficiency following any simulation that reallocates trade between services and non-services goods. The Productivity Commission, under the leadership of Philippa Dee, in collaboration with Australia National University has a major project in this area. Results are reported at their web site:

<http://www.pc.gov.au/research/memoranda/servicesrestriction/index.html>

Although a possible timetable for bringing these estimates into the GTAP protection module was discussed in the 2001 Board Meeting, it is still the case that we should focus on getting the bilateral services trade data in place first and allow for more experimentation with the

services protection data until a consensus is reached on how best to measure and model these barriers.

### **Government Accounts**

A major limitation on the use of GTAP is the incompleteness of the government accounts, and the absence of real data content even in many places where the database structure makes provision for it. We have now begun work to address this. With kind assistance from IMF staff, and in particular Stephen Tokarick, we have obtained IMF Government Finance Statistics data in a suitable format; using this, we (Robert McDougall, Jan Hagemeyer) have generated estimates for income taxes and factor taxes (payroll, land, *etc.*) for incorporation into the GTAP data base. For many countries, this should enable the database to provide if not an accurate, then at least a ballpark estimate of total tax collections, and support policy simulation with revenue replacement.

### **Energy Volumes, Prices and Taxes**

The energy sector is the first area where we have explicitly brought in data on physical flows and sought to reconcile these data with GTAP's value data and independent information on prices and taxes. We have discovered that this is a very challenging task. In many cases the two data sets: that of the International Energy Agency (IEA) and GTAP are simply inconsistent. Also, it is not uncommon for total costs to exceed revenues in some of the energy intensive industries. In the face of these infeasibilities, some adjustments must be made. Chapter 17 of the version 5 data base documentation discusses these issues in considerable detail, also providing a comparison of implied prices between version 4E and version 5. From this, you can see that Jean-Marc Burniaux's adjustments in version 5 made a substantial improvement in the quality of the energy data base in GTAP. More recently, major difficulties were encountered in incorporating Russia into the GTAP 5.3 data base. This work is documented in Robert McDougall's research memorandum on this topic, available on the consortium page of the GTAP web site. His paper offers a valuable case study of the challenges involved in merging input-output data with IEA data.

The next challenge in the energy area is to develop stronger collaboration with the agencies originating these data. If we operate by analogy with the tariff data – in versions 1 and 2 these were obtained from WTO Trade Policy Review Publications. WTO and the World Bank now has become involved in the process of supplying these data directly. UNCTAD has gotten involved, which has brought us directly to the source of the tariff data. In the energy area, we are working to establish closer ties with the IEA. We believe there is much more information and expertise that can be drawn upon and getting them involved and interested would be a good step in the direction of long run improvements in this area.

We envisage the benefit of having IEA's data and expertise support. For example, it is helpful to estimate CO<sub>2</sub> emissions based on IEA's Expanded Energy Balances (EEB), from which the GTAP energy volume data are derived. EEB identifies fairly disaggregated energy commodities. Commodity-specific emission factors are also available from IEA.

These are immediately evident contribution of IEA to an improved GTAP CO<sub>2</sub> emissions data base. For energy prices/taxes, IEA has been expanding the coverage of countries. IEA's data support will be substantial help to reduce workload of collecting country-specific price/tax data and pre-processing.

In January 2004, we obtained the official agreement from IEA on the use of the IEA data for the GTAP data base construction. We have pre-processed the IEA volume data of 2001 for the version 6 GTAP data base and plan to use it in GTAP 6.0.

## **Trade and Demand Elasticities**

To anyone who has used a CGE model for policy analysis it comes as no surprise that the choice of parameter values is key. In the GTAP model, the trade elasticities attract the most attention, as they govern the gains from trade liberalization, as well as the terms of trade effects. These are followed by the consumer demand elasticities and the elasticities of substitution in production. To the extent that we can improve the quality of the GTAP parameters file, it will greatly enhance the credibility and quality of virtually all analyses flowing from the GTAP data base. Some progress was made on several fronts last year and these have since been incorporated in the GTAP 6 pre-release 2 data base.

New estimates of the elasticity of substitution among sources of imports (ESUBM) based on recent econometric work reported in Hertel, Hummels, Ivanic, and Keeney, 2003 ([GTAP Working Paper No. 26](#)) were used in the GTAP 6 pre-release 2 data base. For the elasticity of substitution between domestic and imported goods (ESUBD), we continue to rely on the "rule of two" where  $ESUBM = 2 * ESUBD$ . The revised trade elasticity estimates are available for the 42 GTAP merchandise commodities. We continue to use the previous GTAP trade elasticities that were obtained from the SALTER project for the 15 service commodity groups. Although the average size of the new trade elasticity estimates are not all that different from the previous estimates, they offer more variation across sectors.

Let us turn next to the issue of consumer demand elasticities. Unlike the elasticities of substitution among imports in the GTAP parameter file, the price and income elasticities of consumer demand are country-specific. In the past we have typically focused on the income elasticities of demand and combined these with the assumption of additivity and observed variation in the Frisch parameter across income levels to get own-price elasticities of demand, which can then be modified or augmented with additional observations on own-price elasticities of demand where available (e.g., from the FAO). Together, this is enough information to calibrate the CDE demand system used in GTAP.

The income elasticities of demand have been taken from the international cross-section analyses of Theil and his co-authors, most notably Theil, Chung and Seale (1989), in which they use the International Comparisons Project (ICP) data base. The problem with these studies is that they are now quite dated. They also use commodity groupings that do not fit particularly well with GTAP, and they are defined in terms of consumer goods, not

producer goods. So the commodity goods demanded include the wholesale/retail/transport margins alluded to above.

Jeff Reimer has come up with an alternative approach to the estimation of consumer demands for use in GTAP. He utilizes the per capita national consumer demand data from GTAP directly, adding per capita income from the World Bank and price variation based on the assumption of homogeneous products combined with the GTAP average tariff rates. His results, documented in GTAP Working Paper # 22, compare favorably to updated ICP-based estimates, with the exception that wholesale/retail/transport margins now show up as a distinct category of demand. Reimer's estimation is done at the 10 commodity level using An Implicitly Additive Demand System (AIDADS) invented by Rimmer and Powell. Because this demand system is globally well-behaved it can also be used to generate income elasticities of demand for countries/regions not in the sample as well.

The econometric work by Jeff Reimer was used as the basis for revised demand parameters in the GTAP 6 pre-release 2 data base. The demand parameters for the CDE expenditure function in GTAP are now calibrated from expenditure elasticities that were calculated using parameters from the AIDADS model estimated using GTAP data.

### **Primary Factor Splits**

The general equilibrium incidence of policies also hinges critically on the factor intensities of different sectors. Unfortunately, this aspect of the data base has received less attention than it deserves. Perhaps the most severe problem arises with the treatment of self-employed labor. To the extent that labor payments in the GTAP data base exclude these workers, then the returns to capital will be over-stated. There is good reason to believe that this measurement error has contributed to an excessive capital intensity of many developing countries' economies in the GTAP data base. This is confirmed when we attempt to reconcile GTAP data with household survey data for which profits have been imputed to labor and capital. Accordingly, we have re-estimated the division of value-added between capital and labor (both skilled and unskilled) for the 14 developing countries for which we have household survey data (see GTAP Research Memorandum # 5). This is another reason to aggressively pursue further contributions of household survey data for additional countries. At the upcoming Board meeting we will be looking for agreement on the relevance of incorporating this information into the GTAP data base (e.g., interim releases of version 6).

The other problem that has surfaced in this area has to do with attributing value-added among the various primary factors in agriculture. Due to volatile weather and inelastic demand, value-added is particularly volatile and it is not uncommon for sectors to show negative residual returns, once wage labor is accounted for. Here, we have taken the approach of relying on econometric studies of the sector. This has the advantage of eliminating the idiosyncrasies of the base year for the domestic data base, but it has the drawback that all agricultural sub-sectors within the economy exhibit the same primary factor intensities. Soren Frandsen expressed concern over this point at the last Board meeting, since the Danish research teams spends a fair amount of time on this issue for their

data base – but this is overwritten by the sector-wide econometric estimates when it comes to building the GTAP data base. Since changing these factor intensities is a relatively easy exercise, he proposed to look into it in more detail and report back to us. Any news, Soren?

### **Distribution of the GTAP Data Base**

**Pricing:** In theory, global welfare would be improved by giving away the data base for free – and better yet, giving away the software needed to build it. However, to date, our proposals to obtain public funds to do this have fallen on deaf ears. Meanwhile, data base sales continue to increase their share of the GTAP budget (now about 25%). Consortium membership has leveled off at around 20 members, while the number of data base users has continued to expand. The pricing structure for version 6 is the same as that used for version 5 (see below). Note that we offer a very substantial discount to academic users. In addition, we sell an aggregation-constrained version of the GTAP data base for half the price of the full data base. This is particularly well-suited to students and faculty interested in small-dimensional applications. If they decide later on that they want the full data base, they can upgrade by paying the balance and receiving a license file that releases their aggregation constraint. Finally, we offer a 50% discount to individuals and agencies in the Least Developed Countries (see the Web for a listing of these countries.)

#### ***Version 6 pricing schedule***

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Government/Private sector	\$4000
Upgrade	\$2500
Multiple Academic users	\$1500
Upgrade	\$ 800
Single academic user	\$ 800
Upgrade	\$ 400
50% discount for aggregation-constrained version (10x10 maximum)	
50% discount for Least Developed Country users	

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**Conditions:** The Center has also produced a document formalizing the conditions under which the GTAP data base is distributed. All purchases and contributors to the GTAP data base are required to sign these conditions before obtaining access to the GTAP data base. A copy of the conditions to contributors and the Conditions for supply and use of the GTAP Data Base are provided in Appendix 6.

**Products:** The Second Short Course in Dynamic Modeling will take place in October. Following this course we expect to have a number of additional products. The RunGDyn program, which is equivalent to RunGTAP for the Dynamic GTAP model, is owned by the Centre of Policy Studies at Monash University. They have proposed a pricing schedule of \$1,200 for academics, \$2,000 for government and \$3,000 for the private sector. This is much more expensive than RunGTAP which retails for \$95 and is owned by the Center for Global Trade Analysis.

There will also be a data base and aggregation program which is specific to the GTAP-Dyn model. The GTAP-Dyn Data Base is basically the GTAP Data base with some additional parameters and foreign income flows. We propose that this program be provided to purchasers of the standard GTAP Data base. Finally the Baseline aggregation program will continue to be restricted to the consortium and other individuals assisting with the development of the GTAP-Dyn model.

***New Products***

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RunGDyn	\$1200 (academic) \$2000 (Government) and \$3000 (other)
GTAP-Dyn Data Base	Part of GTAP data base
Baseline	Consortium only

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## **FUTURE MODEL AND DATA BASE DEVELOPMENT**

### **Parameter Estimation and Model Validation**

The basic philosophy behind GTAP is “one data base -- many models”. Therefore, model development has naturally played a lesser role at the board meetings. Since many board members have their own models that utilize the GTAP data base, there is little need to agree on a common model structure. However, in recent board meetings there has been increasing interest in the questions of parameter estimation and model validation, and this has been identified as one of the major goals for the Center in our strategic plan.

*Parameter estimation:* To anyone who has used a CGE model for policy analysis it comes as no surprise that the choice of parameter values is key. In the GTAP model, the trade elasticities attract the most attention, as they govern the gains from trade liberalization, as well as the terms of trade effects. These are followed in frequency of discussion by the consumer demand elasticities and the elasticities of substitution in production. For models of imperfect competition, price-cost markups and measures of unexploited scale economies are also critical. To the extent that we can improve the quality of this parameter file, it will greatly enhance the credibility and quality of virtually all analyses flowing from the GTAP data base. In the past two years progress has been made on the trade elasticity front (see previous section) as well as on the consumer demand elasticity fronts (also discussed in the context of the version 6 data base). However, even in these areas, there remains more work to be done.

The trade elasticities that have been estimated to date only account for substitution among imports from different sources. They do not address the domestic-import substitution possibilities. Currently we simply use the “rule of two” to obtain these substitution elasticities, once the import-import substitution elasticities are known. (Following Jomini et al., the latter are assumed to be twice as large as the former.) However, some recent work on estimating the elasticity of substitution between imports and domestic goods has been undertaken for the United States at the US International Trade Commission (Gallaway, McDaniel and Rivera, 2003). Their work suggests that these values are very low (in particular, lower than implied by the rule of two).

There are some well problems with all of the previous attempts to estimate the domestic import substitution elasticity. One of these has to do with the use of an import price series to identify home vs. foreign substitution. This approach tends to systematically understate the true elasticity because these estimates take price variation as exogenous when estimating the import demand functions, and ignore quality variation. When quality is high, import demand and prices will be jointly high. This biases estimated elasticities toward zero. A related point is that the fixed-weight import price series used by most authors are theoretically inappropriate for estimating the elasticities of interest. CGE modelers generally examine a nested utility structure, with domestic production substituting for a CES composite import bundle. The appropriate price series is then the corresponding CES price index among foreign varieties. Constructing such an index requires knowledge of the elasticity of substitution among foreign varieties (see, for example, the recent work by

Hummels). By using a fixed-weight import price series, previous estimates place too much weight on high foreign prices, and too small a weight on low foreign prices. In other words, they overstate the degree of price variation that exists, relative to a CES price index. Reconciling small trade volume movements with large import price series movements requires a small elasticity of substitution. This problem, and that of unmeasured quality variation, helps explain why typical estimated elasticities are very small. Further scrutiny and evaluation of this work is needed.

The model specification that many international trade economists prefer over Armington is that of monopolistic competition. In this case, there is no need for the “rule of two”, since consumers are simply viewed as substituting amongst varieties, with no particular distinction between home and imported goods. In this case, the previously estimated elasticity of substitution among imports may be appropriate – particularly if it is estimated using highly disaggregated product variety data (e.g., see Hummels, 1999). However, there remains a problem with the monopolistic competition models, and this has to do with the “love of variety” that they exhibit. Even at high levels of provision of existing varieties, consumers and firms are deemed to place a very high premium on additional varieties. Coupled with a strong home-bias, as is typically needed to calibrate the utility and cost functions to observed data, and this can give rise to perverse results in the presence of trade reform (it is rarely beneficial – see Venables, 1987). The problem can be solved by modifying the utility function (Deardorff et al.). However, this introduces another parameter – the “love of variety” parameter – that must also be estimated. Current research underway at Purdue University is aimed at estimating this parameter, appears to diminish as income per capita (and hence provision of existing varieties) increases.

Despite the progress made to date on the consumer demand elasticity front with the version 6 data base (see above). There is also more that can be done here. Thus far attention has been focused on the income elasticities of demand, letting the price elasticities “fall out” by virtue of additivity assumptions. However, it would be highly desirable to estimate these as well, and to calibrate the model to this additional information. (The Constant Difference of Elasticities – CDE – demand system used in GTAP is calibrated to complete vectors of income and own-price elasticities of demand.) One possible source new of information on own-price elasticities of demand is the recent work by James Seale of the University of Florida, working with Anita Regmi at ERS/USDA. They have updated the work of Theil, Chung and Seale using 1996 ICP data, which covers 114 countries. An important features of their work is the estimation of a two-level demand system in which the top level is rather aggregate, as with previous work, and the bottom level determines disaggregated substitution relationships among food products. Incorporation of this work into the GTAP model requires some further thinking about commodity mapping (their final demand categories – especially for non-food products) do not map well to GTAP commodities. There is also a problem of functional form, since adopting their two-level demand system of Seale and Regmi would run counter to our current, aggregation-flexible modeling system. It may be that further progress in this area will require the proliferation of additional, special purpose models such as the GTAP-E model used by those examining energy and climate change policy.

ERS/USDA is currently funding one such effort underway at Purdue University. Roman Keeney, a Ph.D. candidate with the Center for Global Trade Analysis, is constructing a special purpose model for agricultural policy analysis, nick-named GTAP-AGR. This model adopts a simplified food/non-food demand system that is calibrated to the own-price elasticities of demand produced by Seale and Regmi. It also incorporates additional econometric information on factor demand and supply elasticities in agriculture, as well as intermediate input substitution in the food marketing system. The GTAP-EL model currently under development in conjunction with the EPA-funded Integrated Assessment of Climate Change project is another example of this kind of special purpose model. In this case, the key parameters introduced are those associated with land mobility across uses, within an agro-ecological zone, as well as those governing the marginal cost of abatement for the various types of green house gas emissions. More will be said about this model below.

*Model Validation and Hypothesis Testing:* As GTAP-based models become more widely used, the issue of model validation has begun rearing its head with greater frequency. With the ready proliferation of different model structures, we need some method of discriminating amongst alternative specifications. A classic debate has to do with the use of CET parameters on the export side of these models. Similar issues arise in the context of monopolistic competition vs. Armington specifications. Which model is right? Which is the preferred specification for a given region of the world? How can we determine the answer to these important questions?

To date, the Center has undertaken one such hypothesis testing exercise. This is documented in the paper by Liu, Arndt and Hertel (GTAP Working Paper #24, also forthcoming in the *Journal of Economic Integration*). In that paper, we run the model backward in time and ask what parameters best permit the model to explain this historical experience. We then proceed to test several hypotheses. Most important is the “rule of two” whereby the import sourcing elasticity of substitution is twice as large as the import-domestic elasticity of substitution. Notably we fail to reject this hypothesis, thereby lending support to this widespread practice. Other researchers are pursuing similar lines of research (e.g., the work by Arndt and Robinson on Mozambique and the work of Francois). We hope to hear more about this work at the upcoming board meeting and conference. We hope to co-sponsor a workshop bringing together those working in this area at some point in the future.

A somewhat different approach to model validation involves focusing only on a subset of commodities in the model. This is the approach we have been taking in another paper that we hope to present at this year’s conference. In this paper, we focus on agricultural crops and rely on historical variation in supplies to provide our “natural experiment”. We estimate the historical uncertainty in (e.g.) wheat production, then sample from this distribution to generate a distribution of price changes which may then be compared to the observed distribution. This seems like a natural way to evaluate whether (as has been often asserted) models like GTAP generate too much quantity response and too little price variation. This is also a way to help evaluate whether or not a given change in model structure or parameters improves model performance.

## **Dynamic Modeling and a GTAP Baseline**

The dynamic GTAP model, developed by Elena Ianchovichina and Robert McDougall, emphasizes international capital mobility and tracking cross-country ownership of assets. It is now being used by a number of researchers for specific policy applications. Most of these individuals have been involved in some way with the model's development, or they attended the dynamic modeling course offered in October of 2000.

The Second Short Course on the Dynamic GTAP Model will be held October 8-13, 2004. Numbers will again be restricted so if you are interested in attending or sending someone to the course, please reserve a place with Judy Conner. We expect to hold the Dynamic GTAP short course every 2 or 3 years.

We also plan to assemble the technical paper (#17), other documentation on the baseline and welfare decomposition, and the various GTAP-Dyn applications into a book on the dynamic GTAP model over the next few years. It is hoped that a draft of this book will be available for the short course in 2004. Following the short course the RunGDyn software for running the model and data aggregation program will be made available to the public.

A great deal of work is currently being undertaken to update the GTAP-Dyn model to be consistent with the current standard GTAP model and fix any remaining problems. This work should be completed prior to the Dynamic GTAP short Course.

We continue to maintain a shared, baseline data base, which can be used by consortium members for their own dynamic modeling work. This work is being led by Terrie Walmsley. We need continued input from the board in order to ensure that this is useful to those who have a requirement for a baseline, and also to ensure that we are capitalizing on all available inputs.

## **Environmental Modeling – Land use change, with identification of agro-ecological zone**

### ***GHG Emissions Data Bases***

*CO<sub>2</sub> Emissions:* Following the use of the IEA Extended Energy Balances (EEB), we are able to calculate CO<sub>2</sub> emissions based on the IEA EEB for disaggregated energy commodities. In pre-processing the IEA EEB, we distinguish energy commodities used (a) for combustion, (b) for energy transformation (e.g., coal product transformation), and (c) for non-energy purposes (e.g., feedstocks for the petrochemical industry; use of white spirit, paraffin waxes, lubricants, bitumen and other products). This distinction of use allows us to better estimate CO<sub>2</sub> emissions from combustion. Together with the pre-processed EEB, this CO<sub>2</sub> emissions data will also enter the energy module to fit with the GTAP I-O data.

*Non-CO<sub>2</sub> Emissions:* The non-CO<sub>2</sub> emissions data are up on the web as GTAP Resource #1186. In the second half of 2004, we plan to update the non-CO<sub>2</sub> emissions data for the GTAP version 6 benchmark year, i.e., 2001.

### ***Land Use data/GTAP-AEZ***

In the 2002 MIT workshop (GTAP Website, 2002), co-sponsored by the U.S. EPA, MIT, and the Center for Global Trade Analysis, the idea of identifying agro-ecological zoning in the GTAP model was sparked in the discussion among the participating experts. The recognition of various agro-ecological zones (AEZ) is believed to be a more realistic approach in modeling land use change in GTAP, where land is mobile between crop, livestock and forestry sectors within, but not across, AEZ's. In the standard GTAP model, land is assumed to be transformable between uses of crop growing, livestock breeding, or timber plantation, regardless of climatic or soil constraints. The fact is that most crops can only grow on lands that is under certain temperature, moisture, soil type, land form, etc. The same concern arises for land use by the livestock and the forestry sectors. Lands that are suitable for growing wheat may not be good for rice cultivation alike, even under transformation at a reasonable cost. The introduction of the agro-ecological zoning in GTAP helps to clear up the counterfactual assumption in inter-sectoral land transition, and permit a sound presentation of sectoral competition for land.

We are developing a GTAP based CGE model, named GTAP-AEZ, which identifies six agro-ecological zones (AEZ) for the U.S., China, and rest of world. We follow the FAO fashion of agro-ecological zoning (FAO, 2000; Fischer et al, 2002) to identify lands located in six zones. Lands located in a specific AEZ have similar (or homogenous) soil, landform and climatic characteristics. The six AEZs range over a spectrum of length of growing period (LGP) for which their climate characteristics can support for crop growing. AEZ 1 covers the land of the temperature and moisture regime that is able to support length of growing period (LGP) up to 60 days per annum. On the other end of the LGP spectrum, lands in AEZ 6 can support a LGP from 270 to 360 days per annum. Crop growing, livestock breeding, and timber plantation are dispersed on lands of each AEZ of the six, whichever meets their climatic and edaphic requirements. We assume that transition of land in a specific AEZ can occur only between sectors that the land is appropriate for their use.

In GTAP-AEZ, we recognize a unique production function for each of the land-using sectors located in a specific AEZ. For example, the paddy rice sector located in AEZ 1 has a different production function from the paddy rice sector located in AEZ 6. This is to identify the difference in the productivity of land of different climate characteristics. Nevertheless, all the paddy rice sectors located in the six AEZs produce homogenous output to meet market demand.

The AEZ land data of the GTAP-AEZ model are compiled from a data set of land acreage and production of 19 crops and 3 species of timber located in 18 agro-ecological zones (6 AEZs coupled with 3 climate zones—boreal, temperate, tropical). The crop land data are provided by Dr. Navin Ramankutty of the Center for Sustainability and Global Environment (SAGE), University of Wisconsin-Madison. The timber land data are provided

by Dr. Brent Sohngen of Ohio State University.

In GTAP-AEZ, we associate methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O) emissions to their emitting sources (or drivers). For example, we link methane emissions from paddy rice cultivation to the land used in the paddy rice sector of GTAP-AEZ. We treat methane emissions as input to the paddy rice growing, and permit limited substitution of other input for emissions according to estimates of the marginal cost of abatement, following the approach of Hyman (2001).

A workshop on land-use and integrated Assessment Modeling will be held in Washington, DC, on May 24-26, 2004. This workshop is co-organized by the Center, MIT, the Stanford Energy Modeling Forum (EMF), RIVM, ABARE, and US-EPA. Huey-Lin Lee and the contributors of the land use data—Dr. Navin Ramankutty and Dr. Brent Sohngen—will be presenting their work at the May workshop.

### **Income Distribution and Poverty**

From its inception, GTAP-based analyses have tended to focus on the *inter*-regional incidence of policies, as opposed to the *intra*-regional incidence. This is clearly the comparative advantage of a multi-region, global model. However, as GTAP becomes more widely used, the pressure to say something about the distributional impacts of trade policies within countries – especially the developing countries – is becoming ever stronger. This has clearly been the case at conferences focusing on the new WTO round, and it is coming up in the context of national and regional trade policy liberalization as well. This is first and foremost a problem of data – how do we come up with information on expenditure and factor earnings profiles for disaggregate groups of households when we are struggling to simply put together a national data base for many countries? Can we bring the same network externalities to bear in this area, as have worked so successfully in the area of national I-O tables? Can we establish a standard format for the submission of national household survey data that will permit researchers to say something about the regional or global impacts of multilateral trade policy on poverty? We have been thinking about these issues at the Center over the past couple of years, and we currently have a data base of household survey data for 15 countries that we hope to expand to 30 countries with support from the World Bank over the coming year. However, this is still a long way from incorporation into the main GTAP data base, and, at last year's board meeting, the Advisory Board indicated that this was not a high priority for them. So for the time being this activity is being advanced through the efforts of Purdue University and the World Bank.

### **Domestic Margins**

Transportation, wholesaling, and retailing activities, commonly referred to as distribution or marketing activities, play an important role in most economies. Having estimates of the magnitudes of these marketing activities and how they vary across products, users, and regions is important for the analysis of a variety of policies. For example, margins play a crucial role in the analysis of energy policy in two ways. First, information on margins is essential in putting together a credible energy data base because the IEA data

reports prices paid by users while the GTAP data are at producer prices. Second, when conducting carbon tax experiments, the impact of a specific tax on consumer prices will depend on the level of the margin. Another example where margins play an important role is in assessing the impact of trade liberalization on poverty. How a change in the world price will affect consumer and producer prices in a given region will depend on the size of the margins. As the size of the margins increase, a smaller amount of the changes in world prices are transmitted to consumers. In addition, larger margins will accentuate changes in producer price because a larger producer price change is required to achieve the same consumer price change.

Based on the strong interest of the GTAP Advisory Board, expressed at the last couple of annual meetings, we have commissioned Professor Everett Peterson of VPI University to develop a modified GTAP data base that incorporates marketing margins estimates for all GTAP commodities and uses. Last year, Everett presented some preliminary results based on a modified GTAP model and marketing margin estimates for the United States. At the board meeting, quite a number of consortium members volunteered to help gain access to domestic margins for other economies. At the board meeting, Everett will summarize progress in this area. A brief synopsis follows.

Full margin data from the input-output accounts are available for Australia, Japan, The Netherlands and the United States. Data on the total trade and transport margins for five African countries, Mozambique, South Africa, Tanzania, Zambia, and Zimbabwe, based on Social Accounting Matrices developed by the International Food Policy Research Institute (IFPRI) are also available. These data do not identify separate trade and transportation margins nor separate margins for intermediate and consumer purchases. However, they do facilitate comparisons on the magnitude of marketing margins across different regions.

Yet another source of margin estimates based on national input-output accounts is provided by Scott Bradford. He compiled data on the ratio of consumer price to producer price for goods sold to private domestic final demand for 125 product categories from nine countries: Australia, Belgium, Canada, Germany, Italy, Japan, The Netherlands, United Kingdom, and the United States. These data were developed from input-output tables with varying sectoral disaggregations and reference periods between 1990 and 1995. The input-output tables used for Canada, Japan, and the United States contained several hundred sectors; the tables for Australia and the United Kingdom contained about 100 sectors; the tables for Belgium, Italy, and the Netherlands contained 30 to 60 sectors; and the table for Germany was highly aggregated with only ten sectors.

A final source of margin estimates has also been obtained from Mark Gehlhar of USDA/ERS. He has compiled data on the average ratio of retail to manufacturer prices for seven GTAP processed food products (bovine meat products, meat products nec, vegetable oils and fats, dairy products, processed rice, food products nec, and beverages and tobacco products) for 57 regions for the year 2001. These data are from the Euromonitor International Integrated Market Information System. This database covers 95 percent of global retail and food service sales. Industry average mark-ups as defined by Euromonitor include wholesaler, distributor, and retailer or horeca markets. Mark-up estimates are

derived from a combination of official statistics and secondary sources such as trade interviews with companies at all levels of the supply chain.

## **WORKING COMMITTEES**

The following are a list of the current working committees set up in 2001. A number of these committees have been quite successful, however the working committees, their terms of reference and/or the people involved need to be updated to reflect new priorities. While originally intended to be a “committee” the working committees which have been most successful have been those where a consortium member has had the desire to ensure that progress is made. As a result these working committees often reflect a commitment by the GTAP staff member and the consortium member to work together to improve an aspect of the GTAP data base rather than a committee in the usual sense of the word. We are interested in hearing the board’s opinions on the future of these working committees and whether they feel they are a valuable way of establishing working relationship between the Center and consortium members.

### **Services**

The terms of reference of this working committee on services set up in 2001 were to: a) Oversee assembly of Services data on GTAP web site; b) evaluate alternative measures of protection; and c) organize a special session at the Fifth Annual Conference in Taiwan.

Progress has been made on services by the Productivity Commission, Australia and the US ITC, USA. In 2003 a workshop sponsored by the APEC was held in Thailand on Non-tariff barriers. In the Seventh Annual Conference in Washington D.C this year, Michael Ferrantino of the US ITC has put together a special session in this area.

In 2005, Terrie Walmsley and Philippa Dee plan to produce a technical paper using Philippa Dee’s research of the tariff equivalents for services in Russia to examine the impact of Russia’s accession to the WTO using the GTAP model modified to take a count of FDI. The bilateral FDI data base produced by Philippa Dee at the Productivity Commission will also be made available on the GTAP web site. New terms of reference for this working committee are listed in Appendix 7.

### **Technical Barriers to Trade**

The terms of reference of this working committee on technical barriers to trade set up in 2001 were to: a) explore the possibility of using the Hummels method to identifying ad valorem tariff equivalents associated with TBTs and b) try to identify a graduate student or other researcher to implement this scheme on a prototype basis. This was indeed undertaken and the Ph.D. student in question got as far as a prospectus seminar. However, in the end, this did not prove to be an operational approach and the work has now been discontinued.

### **Agricultural Support**

The terms of reference of this working committee on agricultural support set up in 2001 were to: a) collect feedback on the treatment of agricultural support in the version 5 data base; b) explore alternative approaches to the measurement and incorporation of domestic support in the data base; c) identify links with primary factor splits in agriculture; and d) propose a “patch” to version 5 designed to improve on this aspect of the data base.

In a pilot study reported in GTAP Working Paper #19, Dimaranan, Hertel and Keeney revised the treatment of agricultural support by fixing the historical payments paid to land to better reflect their decoupled nature. A similar approach has not yet been implemented on the GTAP data base because of the changes in the GTAP model that will be necessary in order to take advantage of the change in the data structure.

## **UN-SNA**

The terms of reference of this working committee on UN-SNA set up in 2001 were to: a) explore possible links with the UN Statistical Office and b) advise GTAP staff on SNA guidelines that will improve quality of country submissions.

Channing Arndt visited the UN however no progress was made in this activity. Scott McDonald is presenting a paper on this topic at the conference.

## **Russia/Eastern Europe**

The terms of reference of this working committee on Russia and Eastern Europe set up in 2001 were to: a) initiate contacts with potential data base contributors for this region; and b) explore funding possibilities with the US Dept. of Commerce for work on Eastern Europe; and c) encourage increased collaboration in region.

This working committee has been very successful. Russia and Albania have been incorporated into the GTAP data base as a result of the efforts of Robert Koopman from the US ITC.

The Center is also currently collaborating with the contributors of the Russian data in a project examining the impact of Russia’s accession to the WTO, funded by the OECD. This work will be presented at the Seventh Annual Conference on Global Trade Analysis by Vitaly Kharitonov and by Terrie Walmsley in Kazakstan in June.

## **Baseline**

The terms of reference of this working committee on the baseline set up in 2001 were to: a) update material presented by Terrie at 2001 board meeting to reflect most recent GEP forecasts; b) update baseline to reflect version 5 data base; and c) post revised baseline inputs on web site for 211 countries and 66 GTAP regions.

The GTAP baseline was updated to incorporate the latest GEP forecasts and to be consistent with version 5 prior to the last board meeting. Although the terms of reference set out at the 2001 board meeting have been successfully fulfilled there is still a great deal of work that can still be done to improve the GTAP baseline, including further revisions to the labor forecasts, updating to version 6, and incorporating more policy shocks into the baseline. New terms of reference are listed in Appendix 7.

## **Energy**

The terms of reference of this working committee on energy set up in 2001 were to: a) evaluate version 5 data base with respect to energy quality; and b) explore links with IEA and US DOE for future supply of volume and price data.

The working committee on energy has been successful. In 2003, we continued on establishing contact with IEA for the acquisition of IEA energy volume and prices/taxes data. In January 2004, we formally obtained the official agreement from IEA on the use of the IEA Extended Energy Balances and prices/taxes data for the GTAP data base construction.

## **Primary Factor Splits**

The terms of reference of this working committee on primary factor splits set up in 2001 were to: a) explore possibilities for removing self-employed labor payments from capital in contributed data bases; and b) explore possibilities for improving the skilled/unskilled split within labor payments.

No progress has been made in this area. We need to re-activate the Working Committee on this topic and solicit more input from the Board members. New terms of reference for this working committee are listed in Appendix 7.

## **Open Sourcing**

The terms of reference of this committee, set up in 2001, were to work with the GTAP board to identify potential funding sources for the open-source/free data idea.

No such sources have been identified; no activity in this area is currently proposed. New terms of reference for this working committee are listed in Appendix 7.

## **ANNUAL CONFERENCE ON GLOBAL ECONOMIC ANALYSIS**

The Sixth Annual Conference, held in The Netherlands June 12-14, 2003 was a great success. The Seventh Annual Conference will be held in Washington, D.C., following this year's board meeting. Planning for this event is well in hand with 202 abstracts accepted and an impressive list of invited speakers. It is being hosted by the World Bank and co-sponsored by the Center for Global Trade Analysis and the six consortium members based in the Washington, D.C. area. We will get an update on this event at the board meeting.

The organizing committee is also testing a number of new initiatives including special sessions and feature sessions with discussants. We would be interested in hearing the board's feedback on these new initiatives.

Plans are also underway for the Eighth Annual Conference on Global Economic Analysis in Lübeck, Germany. This will take place June 9-11, 2005.

We are also interested in hearing from those interested in hosting the Ninth Annual conference in 2006. Given our aim of increasing access to developing country participants we are eager to find an organization which would be willing to host the conference in a developing country.

## **WEB SITE DEVELOPMENT**

The GTAP web site continues to play a central role in communication among the network members. Appendix 8 provides a comprehensive summary of web site statistics, including activity by country and member, resources available on the web site, etc. The total number of members profiled on the web site is nearly 3,000 and the number of countries represented is now 110. These statistics show that GTAP has truly become a global network.

## **FUNDING AND STAFFING OF GTAP ACTIVITIES**

To be distributed at the board meeting, along with a budget.

## **NOMINATIONS FOR RESEARCH FELLOWS**

Research Fellows are nominated for a three year term. So this year, we must revisit for re-nomination the individuals selected in 2001. In addition, please submit new nominations of deserving individuals whom you think exhibit the kind of capabilities and commitment to excellence in global economic analysis that warrant this honor. To do so, simply submit their name, a brief statement of why you think they are appropriate, and their CV. It would be best if these nominations were made in advance of the meeting, so that we can have the necessary background materials on hand for the board's consideration

## APPENDIX 1. Timetable for Data Base Development Activities

### GTAP 6.0 Construction Plan

Last update: 28Apr04 BD

#### Data Base Release Schedule

Data Releases	New Inputs	COMMENTS	DEADLINE
Pre-release 2		Released to board – April 8	
<b>Pre-release 3 / Final Release</b>	new I-O table (Tunisia) revised tables (KOR, IND, JPN, USA) 2001 agric I-O data and module (2 wks) revised 2001 trade data other protection (tariffs, MFA) 2001 bilateral services trade data 2001 energy data/module (4 wks) government consumption module income taxes sub-module time-series trade time-series macro any bug fixes on pre-release 2	TW RM RM BD/RM RM/JH RM RM/JH RM/JH BD BD BD	May 30 (before the board meeting!)
Final public release	Documentation CD-ROMs	BD/RM JC/MB	Aug 30

#### Data / Modules for GTAP 6.0 Pre-release 3

MODULE	DATA	STATUS	NEXT STEP (NOTES)
I-O TABLE	Tunisia	Recd from TW 18Jan04	
I-O TABLE	Korea (revised)	Recd from TW 23Apr04	(revised by JH Ko)
I-O TABLE	India (revised)	Expected from Chadha/TW	
I-O TABLE	USA	Expected from Marinos/TW	
I-O TABLE	Japan	Expected from TW	(recd from ESRI 19Apr)
I-O TABLE	Others (THA, IDN)		
I-O DISAGG	agricultural I-O data	Data received 10Sep03	pre-processing/module revision (RM)
GOVCON	govt consumption module	Module received 05Apr04	module is a release candidate
PROTECTN	Revised MAcMaps data	Recd from CEPII 10Mar04	Pre-processing & evaluation (BD)
PROTECTN	agricultural tariff (AMAD)	Recd from Paul G. 02Apr04	Pre-processing & evaluation (BD)
PROTECTN	merchandise tariff (WITS)	Recd from Aki K. 04Feb04	Pre-processing & evaluation (BD)
PROTECTN	MFA tax equivalents	Last follow up 13Apr04	pre-processing (RM)
ENERGY	Energy data and module	Pre-processing / module revision (HL/RM)	Allow 4 weeks – RM
TRADE	Revised trade data	Expected anytime now (MG) last follow up 14Apr04	pre-processing (RM)
TRADE	bilateral services trade data	c/o RM	pre-processing (RM)
DF ASSEMBLY	Income taxes sub-routine	c/o JH and RM	pass on to BD
OTHER DATA	TS trade data	Last follow up 14Apr04	pre-processing (BD)
OTHER DATA	TS macro data	Last follow up 13Apr04 (DV)	pre-processing (BD)

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**ACTIVITIES for Next Release**

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Bring in revised IO disaggregation module	RM/BD
Bring in government consumption module	JH/RM/BD
Bring in revised final assembly module (income taxes)	JH/RM/BD
Comparison and decision on protection data (MM vs WITS; MM vs AMAD)	BD
Pre-process and bring in tariff data	BD
Pre-process and bring in MFA/ATC data	RM/BD
Pre-process and bring in revised trade data	RM/BD
Pre-process and bring in bilateral services trade	JH/RM/BD
Bring in revised energy module and data	RM/BD
Pre-process trade time series / macro time series	BD
Packaging (GTAPAgg, FlexAgg) and blurbs	BD

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## APPENDIX 2. Communications with Contributors

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### Outline of Communications with Contributors

#### 1. *Contributor makes contact - DONE*

- a. Contributor emails Terrie Walmsley or contacts GTAP via the web site or referral.
- b. Terrie Walmsley then emails the prospective contributor to:
  - i. introduce herself;
  - ii. present them with a copy of technical paper 1 (Huff, McDougall and Walmsley, 2000);
  - iii. provide them with details of the web site for contributors;  
<http://www.gtap.agecon.purdue.edu/databases/contribute/default.asp>
  - iv. provide them with details of any forthcoming releases; and
  - v. outline the benefits of contributing (see issues below).
- c. Contributors decide whether or not to contribute

#### 2. *Contributor puts together table - DONE*

- a. Information for contributors is available from the following sources:
  - i. The technical paper.
  - ii. The web page. A web page is currently being created to include:
    1. information from the technical paper in a web friendly format;
    2. a problems section which is updated to include recent queries by contributors;
    3. a template for the documentation; and
    4. access to programs used by the GTAP staff and other contributors for:
      - a. putting IO tables together; and
      - b. for checking the IO tables (these are the same programs used in step 3 to check the IO tables).
  - iii. Terrie Walmsley is also available to answer specific questions. Emails are sent out on regular basis to:
    1. give procedural advice (such as suggesting that the mapping is checked early to avoid the contributor having to redo the IO table); and
    2. ensure that any difficulties are addressed early.

#### 3. *Table and draft documentation is contributed - DONE*

- a. Once the IO table has been contributed a number of checks are undertaken:
  - i. The mapping between the original IO table and the GTAP sectors is checked to ensure it is correct

ii. The draft documentation is examined.

- iii. The IO table is checked to ensure that:
  - 1. it balances,
  - 2. contains no negatives, and
  - 3. contains no ridiculous tax.
- iv. In addition we may also raise issues related to:
  - 1. any strange values (i.e. values which indicate that shares are abnormal when compared with representative table);
  - 2. the government sector – whether it has been treated in a reasonable manner; and
  - 3. the dwellings sector.
- b. A report including any problems is then sent back to the contributor. The contributor is then asked to fix any pertinent problems and fix or comment on any other issues raised in the report.
- c. If there are no problems the IO table is sent on to Betina Dimaranan for processing.

#### 4. *Data Processing - DONE*

The table is then used as an input into the data processing stage. If there are any substantial problems at this stage then Betina Dimaranan or Robert McDougall will communicate directly with the contributor to see whether the problem/s can be fixed.

#### 5. *Post Data Processing – PARTIALLY COMPLETED*

- a. Once the IO table has been incorporated into the GTAP data base, the contributor is sent:
  - i. the relevant version of the GTAP data base; - **DONE**
  - ii. the country split out and presented in a SAM structure (following the structure presented in McDonald and Thierfelder, 2003); - **NOT DONE**
  - iii. statistics produced on: - **NOT DONE**
    - 1. the entropy-theoretic measure of the total change in the share structure:

$$D = \frac{1}{2} \left[ \sum_i (F_i - U_i) (\log F_i - \log U_i) \right]$$

where:  $U_i$  is the share in the unfitted table

$F_i$  is the share in the fitted table

- 2. the entropy-theoretic measure of the change in the share structure for each sector.

$$D_i = \frac{1}{2}V[(F_i - U_i)(\log F_i - \log U_i)]$$

where: V is total final demand of the region

- b. From these values the contributor can ascertain by how much the IO table has been altered to ensure that the data for the IO table fits the externally obtained data, such as the macro, trade, protection and energy data. This value can be compared to those of other regions to determine if the table was altered significantly more or less than other regional IO tables. Moreover, the contributor can ascertain by how much individual sectors have been altered. This will aid them in explaining the differences and in case of errors, fix them. - **NOT DONE**
- c. The contributor is then given time to examine these statistics and respond. Any documentation is also finalised. - **NOT DONE**
- d. The documentation and the statistics are then placed on the web for board members and other interested users of the data base to examine. - **NOT DONE**

#### 6. **Further releases - DONE**

Contributors are given access to all data and reports that they are entitled to and that would assist them in improving the quality of their IO tables. We envisage that this access would be granted via the web. This naturally leads to the question: What should contributors receive for contributing data?

- a. Currently contributors receive:
  - i. all pre-, interim and final releases for the version to which they contributed. - **DONE**

#### References:

- Huff, K. R. Mcougall and T. L. Walmsley, 2000, "Contributing Input-Output Tables to the GTAP Data Base" GTAP Technical Paper No 1.
- McDonald, S. and K. Thierfelder, 2003, "Deriving a Global Social Accounting Matrix from GTAP version 5 Data", <http://www.gtap.agecon.purdue.edu/databases/projects/sams/default.asp>.



APPENDIX 3. Strategic Plan

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To be distributed as a separate document.



APPENDIX 4. Sources of I-O tables in GTAP Data Base

Table 1. Sources of I-O tables in GTAP Data Base

Region	Reference period	Source of I/O Table	Version 5.x contributor(s)
AUS	1996-97	Australian Bureau of Statistics (2001)	Terry Maidment and Owen Gabbitas
NZL	1996	Statistics New Zealand	Gerard Malcom Allan Rae
XOC	2001	COMPOSITE	
CHN	1997	Department of National Economy Accounting, State Statistical Bureau, Chinese Statistical Publishing Housing	Zhi Wang, Fan Zhai, and Dianqing Xu
HKG	1988	Tormey (1993)	
JPN	1995	Management and Coordination Agency, Japan (1999)	Mantaro Matsuya
KOR	2000	The Bank of Korea (2003)	Jong-Hwan Ko
TWN	1999	Directorate-General of Budget, Accounting and Statistics (DGBAS). (2001).	Hsing-Chun Lin Shih-Hsun Hsu
XEA	2001	COMPOSITE	
IDN	(1995)	n.a.	Institute of Developing Economies - Japan External Trade Organization
MYS	(1995)	n.a.	Institute of Developing Economies - Japan External Trade Organization
PHL	(1995)	n.a.	Institute of Developing Economies - Japan External Trade Organization
SGP	(1995)	Department of Statistics (1996)	Ni, Houming Toh, Mun-Heng
THA	(1995)	n.a.	Institute of Developing Economies - Japan External Trade Organization
VNM	1996	Social Accounting Matrices for Vietnam: 1996 and 1997. (Chantal Pohl Nielsen)	Chantal Pohl Nielsen
XSE	2001	COMPOSITE	
BGD	1993-94	Bangladesh Planning Commission and Bangladesh Institute of Development Studies (1998)	A.N.K. Noman and Jong-Hwan Ko
IND	1993-94	Input-output transactions table, 1993-94, (Government of India, 2000)	Rajesh Chadha and Pratap Devender
LKA	1989	Center of International Economics, Export Development Broad, Colombo, Sri Lanka	

Continued

Table 1. Sources of I-O tables in GTAP Data Base (Continued)

Region	Reference period	Source of I/O Table	Version 5.x contributor(s)
XSA	2001	COMPOSITE	
CAN	1990	Statistics Canada	
USA	1992 (1996)	U.S. Department of Commerce, Bureau of Economic Analysis (1997)	Kenneth Hanson and Agapi Somwaru
MEX	1995	Secretaria de Pramacion y Presupuesto (1985), Burfisher, Thierfelder, and Hanson (1992)	
XNA	2001	COMPOSITE	
COL	2000	Colombian National Statistical Office (DANE, Departamento Administrativo Nacional de Estadistica)	Alvaro Perdomo
PER	n.a.	n.a.	Juan Jose Echavarria & Maria Arbelaez
VEN	1986	Planning Agency (CORDIPLAN), Venezuela	
XAP	2001	COMPOSITE	
ARG	1984	Secretaria de Planificacion(1986), Argentina	
BRA	1996	Instituto Brasileiro de Geografia e Estatística	Joaquim Bento S. Ferreira Filho
CHL	1986	Central Bank of Chile (1986)	
URY	1983	Banco Central Del Uruguay, Departmentto De Estadisticas Economicas (1991)	
XSM	2001	COMPOSITE	
XCA	2001	COMPOSITE	
XFA	2001	COMPOSITE	
XCB	2001	COMPOSITE	
AUT*	1983 (1995)	Austrian Central Statistical Office, Wien, Austria	Myrna van Leeuwen (LEI)
BEL*	1995	Peeters (Limburgs Universitair Centrum LUC-Deipenbeek, Belgium)	Myrna van Leeuwen (LEI)
DNK*	1992 (1995)	Statistics Denmark, Copenhagen	Myrna van Leeuwen (LEI)
FIN*	1995	Statistics Finland (Leena Kerkela)	Myrna van Leeuwen (LEI)
FRA*	1992 (1995)	Insitut National de la Statistique et des Etudes Economiques, Paris, France (1996)	Myrna van Leeuwen (LEI)
DEU*	1995	Federal Agricultural Research Centre (FAL), Braunschweig, Germany (Martina Brockmeier)	Myrna van Leeuwen (LEI)
GBR*	1990 (1995)	Office of National Statistics	Myrna van Leeuwen (LEI)
GRC*	n.a.	n.a.	Myrna van Leeuwen (LEI)

Table 1. Sources of I-O tables in GTAP Data Base (Continued)

Region	Reference Period	Source of I/O Table	Version 5.x contributor(s)
IRL*	1990 (1995)	Central Statistical Office, Dublin, Ireland (1997)	Myrna van Leeuwen (LEI)
ITA*	1992 (1995)	Instituto Nazionale di Statistica, Rome, Italy (1996)	Myrna van Leeuwen (LEI)
LUX*	n.a.	n.a.	Myrna van Leeuwen (LEI)
NLD*	2001	Statistics Netherlands, IO-table at basic prices (GTAP: market prices) and producer prices	Boudewijn Koole (LEI) Nico van Leeuwen (CPB)
PRT*	1993 (1995)	Instituto Nacional de Estatistica, Lisbon, Portugal (1996)	Myrna van Leeuwen (LEI)
ESP*	1994 (1995)	Universidad de Deusto, San Sebastian, Spain (Azier Minondo)	Myrna van Leeuwen (LEI)
SWE*	1985 (1995)	Statistiska Centralbyran, Orebro, Sweden (1992)	Myrna van Leeuwen (LEI)
CHE	1990 (1995)	Laboratoire d'economie appliquee, University of Geneva (scaled to 1995 at Swiss Federal Institute of Technology)	Markus Lips and Renger van Nieuwkoop
XEF	2001	COMPOSITE	
XER	2001	COMPOSITE	
ALB	2000	HorrIDGE (2000), "Estimating an Albanian Input-Output Table for 2000"	Mark HorrIDGE
BGR*	1996	National Statistical Institute of Bulgaria	Martin Banse
HRV*	1995	n.a.	Martin Banse
CYP	1986	n.a.	Martin Banse
CZE*	1996	n.a.	Martin Banse
HUN*	1991 & 1996	Central Statistical Office, Budapest, Hungary (1999)	Martin Banse
MLT*	1996	n.a.	Martin Banse
POL*	1997	Central Statistical Agency, Warsaw, Poland (2000)	Martin Banse
ROM*	1997	n.a.	Martin Banse
SVK*	1997	n.a.	Martin Banse
SVN*	1997	n.a.	Martin Banse
EST*	1997	Estonian Statistical Office	Martin Banse
LVA*	1997	n.a.	Martin Banse
LTU*	1997	Banse - based on LVA I-O table	Martin Banse
RUS	1997	The Russian Federation State Statistics Committee (2001)	Roman Romashkin and Sergei Kiselev
XSU	2001	COMPOSITE	

Continued

Table 1. Sources of I-O tables in GTAP Data Base (Continued)

Region	Reference period	Source of I/O Table	Version 5.x contributor(s)
TUR	1995	State Institute of statistics (Turkey) 2001	Mustafa Acar
XME	2001	COMPOSITE	
MAR	1990	Maurizio Bussolo and David Roland-Holst (1993)	
TUN	1995	Institut National de la Statistique, (1998)	Denise Konan Ari Van Assche
XNF	2001	COMPOSITE	
BWA	1993-94	McDonald	Mark Horridge
ZAF	1995	Industrial Development Corporation, South Africa	Mark Horridge
XSC	2001	COMPOSITE	
MWI	1994	MERRISA/Wobst	Mark Horridge
MOZ	1995	MERRISA/Arndt et al.	Mark Horridge
TZA	1992	MERRISA/Wobst	Mark Horridge
ZMB	1995	MERRISA/Hausner	Mark Horridge
ZWE	1991	MERRISA/Thomas and Bautista	Mark Horridge
XSD	2001	COMPOSITE	
MDG	1999	National Institute of Statistics, Antananarivo, Madagascar (INSTAT), (2003)	Simon Njaka Randrianarivelo Shuby Andriamanajara
UGA	1992	Ugandan National Statistics Department (UNSD)	Adam Blake
XSS	1997	COMPOSITE	

\* Input-output tables of European Union member countries and the CEECs were adjusted to match target values for EU agricultural production in 2001 as supplied by Hans Jensen.

APPENDIX 5. GTAP Policy on Input-Output Table and Dataset Contributors

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APPENDIX 6. Conditions on the Use and Supply of the GTAP Data Base

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APPENDIX 7. Working Committees

Committee Name	Chairperson	GTAP Center	Year	Terms of Reference
Services	Philippa Dee	Terrie Walmsley	2004	<ol style="list-style-type: none"> <li>1. Oversee assembly of Services data on GTAP web site.</li> <li>2. Technical paper on services liberalization.</li> </ol>
Baseline	Dominique van der Mensbrugge	Terrie Walmsley	2004	<ol style="list-style-type: none"> <li>1. Update macro forecasts to reflect most recent GEP forecasts.</li> <li>2. Examine possibility of better labor forecasts.</li> <li>3. Update baseline to reflect version 6 data base.</li> <li>4. Work with consortium members to increase coverage of policy shocks</li> </ol>
Energy	???	Huey-Lin Lee		<ol style="list-style-type: none"> <li>1. Evaluate version 6 data base with respect to energy quality.</li> <li>2. Maintain contact with IEA and explore links with other energy data authorities (e.g., US DOE) for future supply of volume and price data</li> </ol>
Primary Factor Splits	???	Betina Dimaranan	2004	<ol style="list-style-type: none"> <li>1. Explore possibilities for removing self-employed labor payments from capital in contributed data bases.</li> <li>2. Explore possibilities for improving the skilled/unskilled split within labor payments.</li> </ol>
Open-sourcing	???	Robert McDougall	2004	<ol style="list-style-type: none"> <li>1. Work with GTAP board to identify potential funding sources for the open-source/free data idea.</li> </ol>

## APPENDIX 8. Web Site Statistics Summary

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### Definitions

This report is based on two sources of activity statistics, 1) the raw Web server logs, and 2) statistics collected from the on-line GTAP Network.

- Server logs: Record every Web page or file requested, when the file was accessed, where it was requested from, the originating IP address, the time it took for the request to complete, etc. The purpose of this is to monitor server performance, record unauthorized requests and provide an audit trail of server activity. Information from the server logs is not nominal, i.e. the logs do not tell who visited the site. In the present statistics we excluded from the server logs all requests originating from Purdue University, and all requests from crawlers, search engines, and other automated indexing services.
- GTAP Network: The GTAP Network is a repository of registered members, i.e. users who took the time to create a profile on the GTAP Web site. Most of the information available on the GTAP site does not require users to register. A visitor would typically register to submit an order, apply to a course or conference, subscribe to the GTAP-L mailing list, contribute a new GTAP application, or just because they deem worthwhile to be listed in our on-line database. All members of the GTAP Directory are also members of the GTAP Network. Members of the GTAP Network who never contributed to the GTAP Project are listed on the Web site as "other members".
- GTAP Directory: A directory of GTAP contributors, i.e. members who purchased a version of the GTAP data base, attended a course or a conference, past and current Advisory Board Members, Research Fellows, data contributors, and project team members.

### Composition of the GTAP Network

The following statistics are extracted from the on-line GTAP Network as of April 26<sup>th</sup> 2004.

	2004	2003	Change
Total number of members in GTAP Network .....	2,976	2,116	+40.4%
New Network members since previous Board Meeting .....	969	678	+42.2%
Total number of contributors in GTAP Directory .....	872	797	+9.4%
New Directory members since previous Board Meeting .....	85	146	-41.8%
Average new Network members/week .....	19	13	+46.2%
Total number of countries represented .....	110	101	+10.9%

Table 1: Top 25 Countries in the GTAP Network (in absolute terms and per capita)

	<i>Country</i>	<i>Members (absolute terms)</i>	<i>Percent of Total</i>	<i>Country</i>	<i>Members per capita (per million)</i>
1	United States	632	21.2%	St. Kitts & Nevis	25.0
2	Japan	201	6.8%	New Zealand	9.0
3	Australia	142	4.8%	Switzerland	7.8
4	United Kingdom	136	4.6%	Australia	7.2
5	Germany	114	3.8%	Denmark	6.7
6	China	108	3.6%	Singapore	5.4
7	France	106	3.6%	The Netherlands	5.3
8	Taiwan (ROC)	99	3.3%	Belgium	4.5
9	The Netherlands	85	2.9%	Taiwan (ROC)	4.4
10	India	82	2.8%	Belize	4.0
11	Canada	75	2.5%	Finland	3.7
12	Korea	68	2.3%	Iceland	3.6
13	Italy	67	2.3%	Uruguay	3.2
14	Switzerland	57	1.9%	Botswana	3.2
15	Brazil	55	1.8%	Maldives	3.0
16	Indonesia	47	1.6%	Albania	2.8
17	Belgium	46	1.5%	Hong Kong	2.7
18	South Africa	40	1.3%	Norway	2.6
19	Argentina	38	1.3%	Malta	2.5
20	Thailand	37	1.2%	Canada	2.3
21	Denmark	36	1.2%	Ireland	2.3
22	New Zealand	34	1.1%	United Kingdom	2.3
23	Turkey	33	1.1%	United States	2.2
24	Vietnam	29	1.0%	Sweden	2.0
25	Peru	27	0.9%	T. and Tobago	1.8

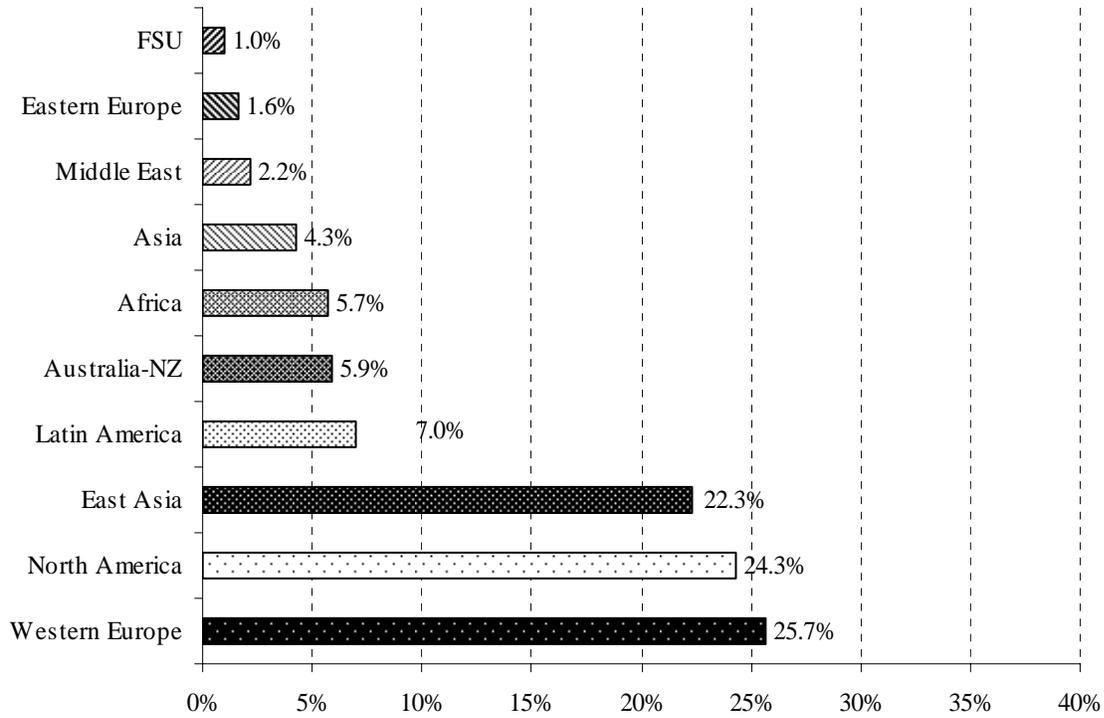


Figure 1: Regional Composition of the GTAP Network (percent)

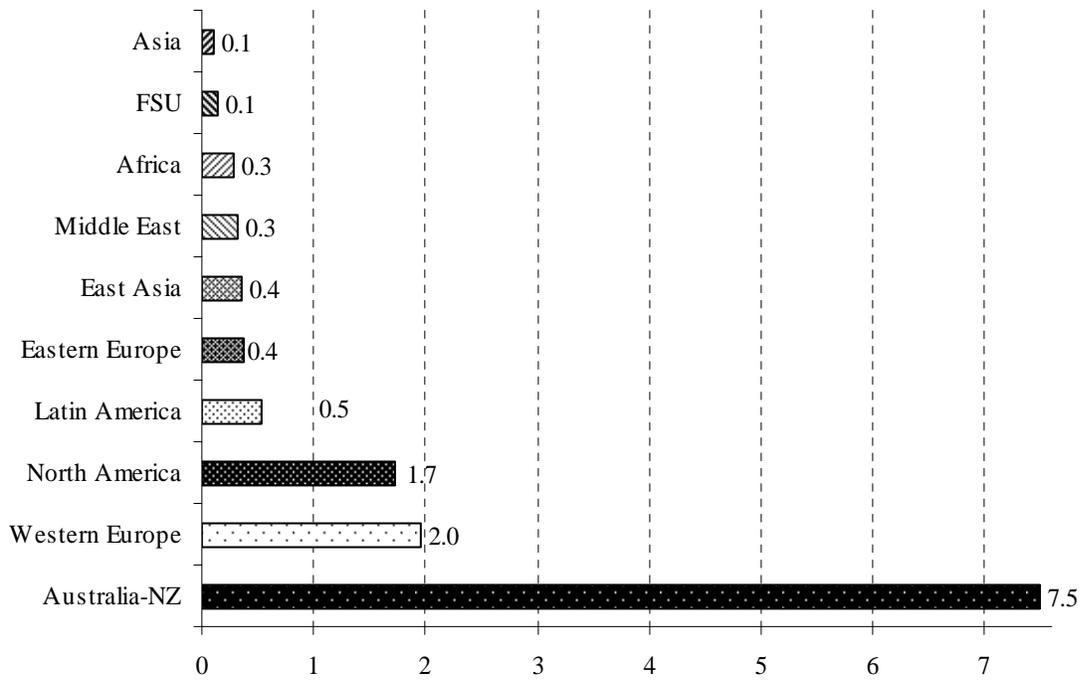


Figure 2: Regional Composition of the GTAP Network (members per million)

Table 2: Composition of the GTAP Directory

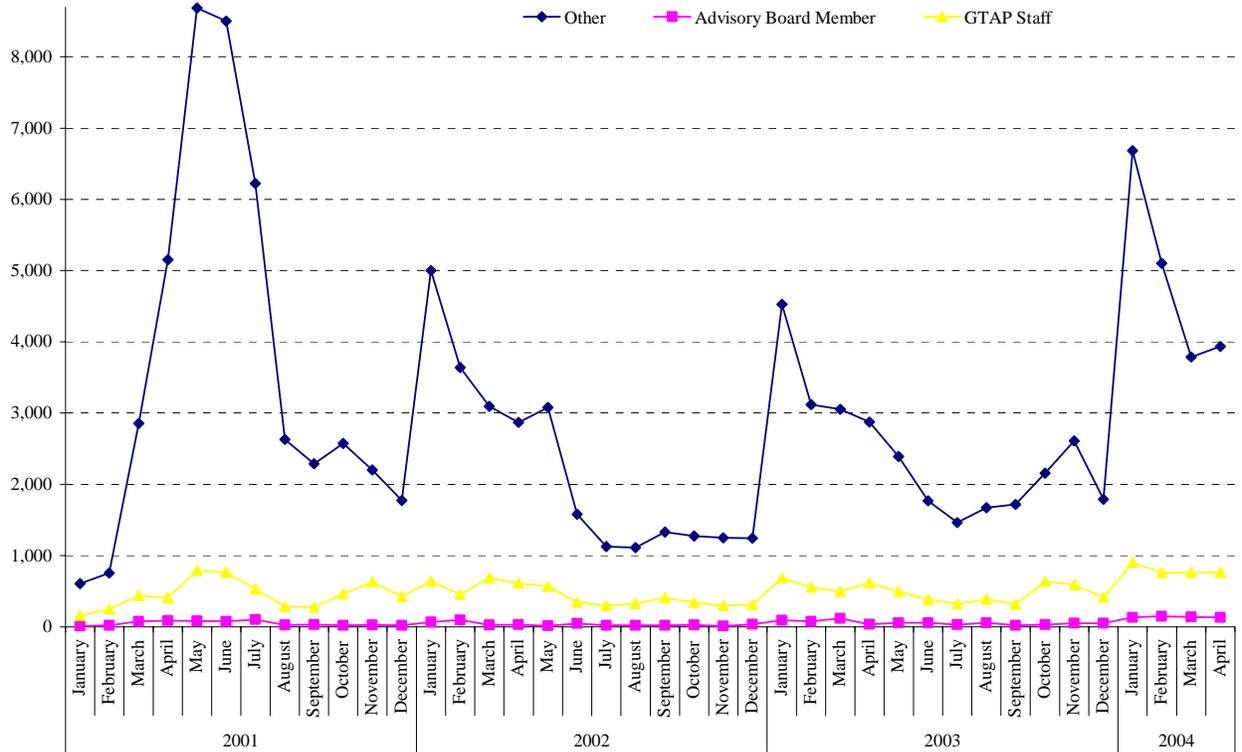
<i>Role in the GTAP Directory</i>	<i>Members</i>
Advisory Board Members	54
Advisory Board Member	23
Past Board Member	31
Conference Participants	380
Conference Participant	335
Reviewer	44
Contributors	72
Data Base Contributor	18
I-O Contributor v6.0	10
I-O Table Contributor	44
Course Participants	732
1993 Short Course Participant	22
1994 Short Course Participant	23
1995 European Short Course Participant (Frankfurt)	23
1995 Short Course Participant	22
1996 Advanced Course in Global Trade Analysis	10
1996 Short Course Participant	23
1997 Advanced Course in Global Trade Analysis	10
1997 Short Course Participant	29
1998 African Short Course Participant	22
1998 Short Course Participant (The Netherlands)	20
1999 Short Course Participant	29
2000 Dynamic GTAP Short Course	14
2000 Short Course Participant	27
2001 Short Course Participant	27
2002 Short Course Participant (Sheffield UK)	25
2002 Web-Course Participant	5
2003 Short Course Participant	29
2003 Web-Course Participant	4
2004 Latin American Short Course Participant	29
Course Instructor	35
Short Course Alumni	304
Data Base Subscribers	465
V2 Data Base Subscriber	42
V3 Data Base Subscriber	51
V4 Data Base Subscriber	119
V5 Data Base Subscriber	184
V6 Data Base Subscriber	69
Project Members	10
EPA Project Member	3
SAM Project Member	7
Research Fellows	26
1996 Research Fellow	8
1997 Research Fellow	2
1999 Research Fellow	3
2000 Research Fellow	2
2001 Research Fellow	3
2002 Research Fellow	3
2003 Research Fellow	5
Alan A. Powell Award Recipient	9

**Activity Statistics for the GTAP Network (Authenticated Users)**

These statistics are not extracted from the server logs, but from users signing in to the GTAP Web site. As a reminder, signing in is not required on the GTAP Web site, unless a member wishes to edit his/her profile, or make new contributions.

	2004	2003	Change
Total number of authenticated visits since previous Board Meeting.....	9,911	7,422	+33.5%
Total number of authenticated visitors since previous Board Meeting .....	1,415	1,203	+17.6
Average number of authenticated visits/week.....	191	143	+33.5%
Average number of authenticated visitors/week.....	27	23	+17.4

\* Note: visits from GTAP Staff members were excluded.



**Figure 3: Monthly Authenticated Visits (January 2001 - May 2004)**

Table 3: Yearly Visits by Advisory Board Members

	2001	2002	2003	2004	Total
Adkins, Liwayway (United States)	-	30	28	44	102
Bagnoli, Philip (France)	-	16	20	26	62
Bohman, Mary (United States)	-	22	-	-	22
Brockmeier, Martina (Germany)	49	62	36	72	219
Dee, Philippa (Australia)	25	2	-	14	41
Devlin, Robert (United States)	-	1	-	38	39
Diao, Xinshen (United States)	14	-	-	-	14
Francois, Joseph (The Netherlands)	49	6	32	30	117
Frandsen, Soren E. (Denmark)	94	20	10	52	176
Jean, Sébastien (France)	4	50	136	50	240
Jomini, Patrick (Australia)	-	-	-	4	4
Kawasaki, Kenichi (Japan)	46	50	36	16	148
Koopman, Robert (United States)	34	38	24	14	110
Lejour, Arjan (The Netherlands)	12	6	50	32	100
Low, Patrick (Switzerland)	-	-	-	6	6
Martin, Will (United States)	55	6	58	38	157
Omori, Takashi (Japan)	-	4	-	-	4
Pant, Hom (Australia)	4	26	40	14	84
Powell, Alan (Australia)	63	34	-	4	101
Reilly, John M. (United States)	18	12	14	4	48
Robinson, Sherman (United States)	10	2	-	-	12
Somwaru, Agapi (United States)	60	18	60	22	160
van Tongeren, Frank (The Netherlands)	28	34	82	12	156
Vanzetti, David (Switzerland)	14	14	34	22	84
Yoshioka, Shinji (Japan)	-	1	-	16	17

Table 4: Top 25 Visiting Countries (past 12 months in absolute terms)

	Country	Visits	Percent of Total
1	United States	8,61	52.0%
2	Japan	683	4.1%
3	Australia	604	3.6%
4	France	528	3.2%
5	Germany	500	3.0%
6	The Netherlands	489	3.0%
7	China	372	2.2%
8	United Kingdom	357	2.2%
9	India	348	2.1%
10	Denmark	340	2.1%
11	Taiwan (ROC)	287	1.7%

1			
2	Italy	284	1.7%
3	Finland	254	1.5%
4	Korea	224	1.4%
5	Switzerland	203	1.2%
6	Bangladesh	173	1.0%
7	Peru	130	0.8%
8	Brazil	127	0.8%
9	Indonesia	117	0.7%

2 0	Canada	109	0.7%
2 1	New Zealand	109	0.7%
2 2	Ireland	106	0.6%
2 3	Thailand	104	0.6%

2 4	Turkey	101	0.6%
2 5	Argentina	93	0.6%

Table 5: Top 50 Visitors (past 12 months, GTAP Staff Excluded)

<i>Network Member</i>	<i>Visits</i>	<i>Network Member</i>	<i>Visits</i>
Jean, Sébastien (France)	122	Lejour, Arjan (The Netherlands)	52
Andriamananjara, Soamiely (United States)	108	Strutt, Anna (New Zealand)	52
Hossain, Sharif Mosharrif (Bangladesh)	106	Sawauchi, Daisuke (Japan)	50
Jensen, Hans Grinsted (Denmark)	98	Huang, Hsin (France)	50
Brockmeier, Martina (Germany)	94	Fang, Lan (China)	47
van Leeuwen, Nico (The Netherlands)	90	Che Fru, Aaron (Germany)	46
Pohjola, Johanna (Finland)	82	Salamon, Petra (Germany)	46
Somwaru, Agapi (United States)	80	Rau, Marie-Luise (Germany)	46
Kerkela, Leena (Finland)	78	Lips, Markus (Switzerland)	44
Saracoglu, Durdane Sirin (Turkey)	72	McDonald, Scott (United Kingdom)	44
Walsh, Keith (Ireland)	72	Francois, Joe (The Netherlands)	44
Maidment, Terry (Australia)	70	Sunde, Thomas (United States)	42
Nielsen, Chantal Pohl (Denmark)	66	Vaaitinen, Risto (Finland)	42
Martin, Will (United States)	64	Yanagisawa, Akira (Japan)	40
Pratap, Devender (India)	64	Hsu, Shih-Hsun (Taiwan (ROC))	40
Fox, Alan (United States)	64	Bagnoli, Philip (France)	40
Manole, Vlad (United States)	62	Joseph, Brigit (India)	39
Nguyen, Hanh (Ukraine)	62	Devlin, Bob (United States)	38
Frandsen, Soren (Denmark)	60	Cuadra, Gabriela (Peru)	38
Adkins, Liwayway (United States)	60	Singhapreecha, Charuk (Thailand)	38
Tabeau, Andrzej (The Netherlands)	60	Kuiper, Marijke (The Netherlands)	38
Elbehri, Aziz (United States)	58	Vanzetti, David (Switzerland)	38
Klinkenberg, Onno (The Netherlands)	57	Wang, Jiao (United Kingdom)	36
Buetre, Benjamin (Australia)	56	Tarr, David (United States)	36
Das, Gouranga (Korea)	56	Wu, Chia-Hsun (Taiwan (ROC))	36

## GTAP Resource Center

The statistics below are extracted from the on-line GTAP Resource Center as of April 26<sup>th</sup> 2004.

	2004	2003	Change
Total number of resources .....	1,078.....	1,005 .....	+7.3%
New resources since last Board Meeting.....	164.....	195 .....	-1.7%
Total number of GTAP Applications .....	606.....	536 .....	+13.1%
New GTAP Applications since last Board Meeting .....	73.....	101 .....	-27.7%
Total number of full-text resources .....	695.....	654 .....	+6.3%
Average number of new resources/month .....	13.....	16 .....	-18.7%

Table 6: Composition of the GTAP Resource Center

<i>Category</i>	<i>2004</i>	<i>2003</i>	<i>Change</i>
GTAP Applications	606	540	+12%
Other CGE Applications	18	-	-
Technical Papers	21	21	-
Working Papers	30	25	+20%
Research Memoranda	5	-	-
Documentation	154	153	+0.6%
Model file (.TAB)	9	8	+13%
Utilities	11	10	+10%
Product Updates	3	3	-
Aggregations	20	20	-
2004 Conference Papers	17	0	-
2003 Conference Papers	104	99	+5%
2002 Conference Papers	144	144	-
2001 Conference Papers	83	83	-

Table 7: GTAP Applications by Country

<i>Country</i>	<i>2004</i>	<i>2003</i>	<i>Change</i>
United States	207	188	10.1%
Australia	94	88	6.8%
Japan	46	43	7.0%
The Netherlands	43	39	10.3%
Denmark	26	28	-7.1%
Germany	27	25	8.0%
France	21	12	75.0%
New Zealand	19	21	-9.5%
Finland	14	10	40.0%
South Korea	14	13	7.7%
United Kingdom	10	15	-33.3%
Switzerland	9	4	125.0%
Brazil	7	8	-12.5%
Taiwan (ROC)	9	9	-
India	5	4	25.0%
Italy	5	3	66.7%
China	5	3	66.7%
Ethiopia	4	3	33.3%
Canada	4	3	33.3%
<i>Country</i>	<i>2004</i>	<i>2003</i>	<i>Change</i>
Indonesia	3	2	50.0%
Kuwait	3	2	50.0%
Turkey	3	3	-
Belgium	2	2	-

Argentina	1	1	-
Bangladesh	1	0	-
Brazil	1	0	-
Colombia	1	1	-
Croatia	1	1	-
Mozambique	1	1	-
Norway	1	1	-
Philippines	1	0	-
South Africa	1	0	-
Spain	1	0	-
Uruguay	1	0	-
Zimbabwe	1	0	-
Kenya	0	1	100.0%
unknown	14	3	366.7%
<b>Total</b>	<b>606</b>	<b>536</b>	<b>13.1%</b>

## General Access Statistics

This is a brief summary of the Web site statistics for 2003-2004. All hits originated from a user on the Purdue network have been filtered out. These statistics are extracted from the raw Web server logs.

Tracked pages: <http://www.gtap.org/>  
Report range: January 1<sup>st</sup>, 2003 – May 1<sup>st</sup>, 2004 (16 months)

	<i>Jan 2003-May 2004</i>	<i>May 2002-May 2003</i>	<i>Change</i>
<b>Visits</b>			
Average Hits per Day .....	7,454.....	6,182 .....	+20.6%
Average Hits per Visitor.....	15.71.....	20.67 .....	-23.9%

<b>Visitors</b>			
Total Visitors .....	216,356.....	107,352 .....	+101.5%
Average Visitors per Day .....	474.....	299 .....	+58.5%

### Activity

Busiest day of week:..... Wednesday..... Wednesday  
Slowest day of week:..... Saturday..... Saturday  
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