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REPORT ON
INTERNATIONAL MASTER CLASS
ON
CGE MODELLING

CHULALONGKORN UNIVERSITY
BANGKOK

13-21ST DECEMBER 2005

Introduction

Computable general equilibrium models are now widely used as tools of applied policy research. They are especially well suited to the analysis of policy issues involving the agricultural sectors of developing countries. These policies frequently touch upon the interactions of different parts of the economy and general equilibrium models are designed specifically to deal with these kinds of economic interactions.

Effective use of these models is limited when policy advisors and research directors do not have a clear understanding of what these models do and how the results from them should be interpreted. To interpret the results from the models, what is needed is skill in seeing the economic mechanisms underlying the results and the way these mechanisms depend on the structure of the models and the assumed values of key parameters. Even direct users of the models sometimes treat them as ‘black boxes’ and find it difficult to interpret the economic meaning of the results obtained from them.

The purpose of this Master Class was to develop skill in relation to these matters. The Class dealt primarily with small models in order to focus upon the development of understanding. Once small models have been understood, larger models are much easier to understand. The reverse does not always apply. Exposure to large models in the first instance often obstructs understanding because the complexity of these models can be overwhelming.

The Master Class dealt in particular with two specific applications of CGE modelling: accounting for the way that policy affects poverty incidence and accounting for issues of regional trade in agricultural products.

Objectives

- To acquaint senior policy advisers and academic research directors with the tool of quantitative economic policy modelling using applied general equilibrium models.

- To give participants strong insights into the scope and limitations of these tools so that they can make better use of the research resources at their disposal.
- To improve communications between these senior personnel and the PhD and Masters' level members of their staff so as to enhance the policy research enterprise, both with respect to scope and to quality.

The specification was that participants:

- Should be able to speak English quite well
- Have a basic background in economics
- Be senior policy advisors or research directors

The Class was held at Chulalongkorn University in Bangkok. As all of the participants were coming from South East Asian countries, Bangkok was a central place to meet. Professor Isra Sarntisart from Chulalongkorn University was part of the team and was able to negotiate to hold the workshop at this institution. Holding the workshop in Thailand meant that we had the technology required to conduct the course. This may not have been the case in other countries in the region. Bangkok was also an advantage in that the cost of running a workshop of this nature was much more affordable than if it had been organized in Australia.

Administrative organisation

Organisation of the workshop began with discussions between Dr Ray Trewin (ACIAR) and Professor Peter Warr (Poverty Research Centre, ANU). As talks developed, administrators from both these centres were involved in the discussions. A meeting was held later which included Paul Ferrar from the Crawford Fund. At this meeting Paul agreed to contribute funding to the project and also be responsible for requesting further funding from organisations such as the World Bank Institute and the Kirk Foundation. When attempts to locate extra funding were unsuccessful, the Crawford Fund agreed to supply any extra funding required for the course. The World Bank contributed the services of guest lecturer, Will Martin. Will Martin's accommodation and airfare costs were also covered by the World Bank.

A decision was made in late August 2005 to hold the course in December. However, negotiations with the ANU meant that we still were not 100% sure until the end of October that the course could actually occur. Meanwhile, we booked flights so that they would be available once we received confirmation from the university. Once we had confirmation, ACIAR started inviting our international participants so that they would have time to apply for visas. We then proceeded to confirm our flights and book the accommodation which could not be cancelled after the booking had been confirmed.

Ray Trewin and Trish Andrews from ACIAR invited participants from Cambodia, Laos, Thailand, Indonesia, and China. Peter Warr was in contact with two Burmese

students who had scholarships to study at the ANU and they were also invited to participate in the course. Although some of the persons who were invited initially were unable to attend, they gave us recommendations of others to attend. We ended up with 4 from China, 4 from Vietnam, 2 from Cambodia, 3 from Laos (we had invited two but ended up with one extra), 6 from Indonesia, 2 from Burma and 11 from Thailand. The only specific costs incurred for the Thais were incidentals such as printing costs, lunch and gifts.

The Australian team arrived in Thailand late on the 10th of December so that they would have a couple of days before the course started to set up the computers, organise printing and generally prepare for the Master Class. The other participants arrived on the 12th. We encouraged participants to arrive before the course started so that they would not miss the beginning of the course.

Prior to and during the course Caroline and Peter from the Poverty Research Centre, RSPAS, Australian National University (ANU) were greatly assisted by Dr Isra Sarntisart and Ms Laddarat Wattanasakorn (Som) in the organisation and administration of the Master Class. Som organised the caterers to supply the lunches as well as liaising with the accommodation and assisting with many other administrative tasks. This support proved invaluable.

Initially Paul Ferrar was hoping to be able to visit the workshop in Bangkok. However when he was no longer able to attend he wrote a letter of welcome and introduction to the participants which we placed at the front of the manuals.

All participants, teaching and administrative staff from outside of Thailand stayed on campus at Chulalongkorn University. It was necessary that we accommodate people in a combination of Sasa International House and Widhaya Nivet Guesthouse as we had too many people to be accommodated all together in either facility. These two places of accommodation were next door to each other so this did not cause any problems. Sasa was more upmarket than Widhaya Nivet but both places were clean and conveniently located. Those persons accommodated at Widhaya Nivet were given a room on their own whereas we organised those that could be paired up into double rooms at Sasa which seemed to work reasonably well. All staff from Australia stayed at Widhaya Nivet.

The accommodation was approximately 10 minutes walk from the Faculty of Economics where the Master Class was held. This meant that it was convenient for participants to walk to and from the accommodation to the classroom. There is also an internal shuttle bus that connects different points in the university and which can be taken from the faculty to the accommodation and back again. This bus is only 2 baht (6cents) per ride, but it was generally just as convenient to walk.

Having the accommodation close to the Master Class was particularly important in Bangkok due to problems that would otherwise be faced with Bangkok traffic.

Participants involved

The list of participants is given in Attachment 1. Participants came from 6 countries as follows:

Vietnam (4 participants), China (4 participants), Indonesia (6 participants), Laos (3 participants), Cambodia (2 participants), Burma (2 participants) and Thailand (11).

As the course was held in Bangkok we had a large number of Thai people attend the course. It was important that we insisted with the Thai participants that if they were going to attend the class they needed to attend the whole course and not just part of it so that they received the full value of the course and were not delaying the rest of the participants from progressing. Holding the Master Class in Bangkok caused some problems for Thai participants. A response we received in the questionnaire described below was the suggestion that future classes be held out of Bangkok so that the Thai participants' supervisors could not call them back to work. This area was obviously a difficult one for the Thais as it was for the organisers.

Lecturers and Instructors

Lecturers:

- Professor Peter Warr, Team Leader (Poverty Research Centre, Australian National University)
- Dr Isra Sarntisart (Chulalongkorn University-Bangkok)
- Dr Rina Oktaviani (IPB-Bogor Indonesia)
- Will Martin (World Bank)

Computer lab session instructors (all ANU graduate students):

- Mr Arief Anshory Yusuf (Indonesian speaker and team leader)
- Ms Arriya Mungsunti (Thai speaker)
- Mr Philip Liu (Mandarin and Cantonese speaker)
- Mr Dang Duc Anh (Vietnamese speaker)

Difficulties with finances

The organisers had a number of difficulties with finances. Our initial problem was trying to establish whether or not this would be treated by the ANU as a grant or a consultancy. If it was accepted as a grant then no overheads are charged. If however, it was to be viewed as a consultancy then 17% of the total amount would be charged by the ANU for management of project finances. In this case it was not clear which category was to be used. After some negotiation with the university it was finally agreed that the project would be accepted as a 'workshop' and a flat fee of \$3000 was charged by the Research School of Pacific and Asian Studies (RSPAS) for administrative costs.

The next financial challenge we had was accessing the money in Thailand. Our initial plan was to put some money in a centre account at Chulalongkorn University and administer the funds from there. However, we realised too late that this was not possible as money which went through Chulalongkorn would incur a 10% fee and would also take a few weeks to process. Dr Isra Sarntisart offered us his personal bank account details to put money in but the ANU would not allow us to do this. By the time we realised this difficulty it was also too late to organise a bank draft. This issue was further complicated when we found out that one of the guest houses where our staff and participants were being accommodated could not take credit card. This was a difficult position to be in as the ANU is very reluctant to have people carry large amounts of cash.

Due to the difficulty we were having with this financial organisation and the very small amount of time left before Caroline was to depart for Thailand, the ANU agreed to give Caroline an extra advance. This meant that she now had about A\$21,000 in cash to take to Thailand and pay for participant's allowances, one of the guest house bills and other expenses. Caroline organised to have her eftpos limit increased from \$1000 to \$2000 while still in Australia so that she could withdraw the money in Thailand. This seemed like a good plan until she arrived in Thailand and went to withdraw money. The Thai daily limit on EFTPOS machines is the equivalent of \$700. This would mean that Caroline would not be in Thailand long enough to withdraw all the money that she needed.

She enquired at a bank as to how she could get more money and was recommended to send money via moneygram. This would allow her to be sent up to A\$10,000 a day. Caroline organised for her husband to contact Thomas Cook in Australia and have the money sent across. Unfortunately the fee for the moneygram was very high but at least we had some cash we could use to pay for expenses. We still needed more cash and as Peter's wife was coming to Thailand at the end of the week she very kindly agreed to bring \$9000 with her.

This money meant that we had most of what we required to pay for our necessary expenses in Thailand. We were able to reimburse some of the airfares for participants from countries such as Cambodia and Laos where the majority of participants do not have bank accounts and so would be very difficult to reimburse from Australia. We paid for one of the guest houses with credit and the other with cash.

Future Master Classes held in Thailand would benefit greatly from taking bank drafts or perhaps travellers cheques. It is important to establish beforehand what can be paid with credit card as many smaller service providers in Thailand still do not accept credit cards and want to be paid in cash.

Master Class program

Full detail of all lectures, practical classes and teachers are shown in the Program in Attachment 1.

Notes and Handouts

A copy of each of the handouts is attached to this report.

Presentation of Master Class certificates

At the end of the Master Class there was a formal closing ceremony with the presentation of certificates. Everyone greatly appreciated receiving the full colour printed certificates signed by Professor Warr. We also handed out koalas and ANU/Australian keyrings to everyone present. There was one glitch, however, and that was the placement of the Chulalongkorn University logo. Half an hour before the presentation of the certificates, Professor Isra noticed that the Chulalongkorn University logo, which is in fact the Thai king's logo, had been positioned below the ANU logo. This was technically illegal as the king's logo always needs to appear on top. As it was almost time to present the certificates there was nothing that could be done so they were distributed. However Dr Isra spoke in Thai to the Thais and explained how this mistake had occurred.

Feedback from participants

Feedback was sought from participants by circulating a questionnaire with 13 questions, for return by the end of the Class. This proved a very valuable exercise for future planning, since it revealed a number of areas where the content or the balance of the Class was not optimal. A summary of the feedback received is in attachment 3 and provides important information for the organisation of future CGE Modelling master classes.

Comment by Director of Master Class Program (Professor Peter Warr)

It was very gratifying that the master class was well received by all participants. There was universal agreement that the class had achieved its objectives. Some participants provided suggestions for improving the master class should it be held again and these comments were much appreciated. An illustration of the enthusiasm shown by the participants was that even after the last day of classes many students remained behind in the lab to discuss modeling issues with the course instructors. The contribution of the sponsors to the achievement of a satisfying outcome for all was gratefully recognized by all involved.

Peter Warr and Caroline Ashlin
Canberra

February 2006

Photos from Master Class



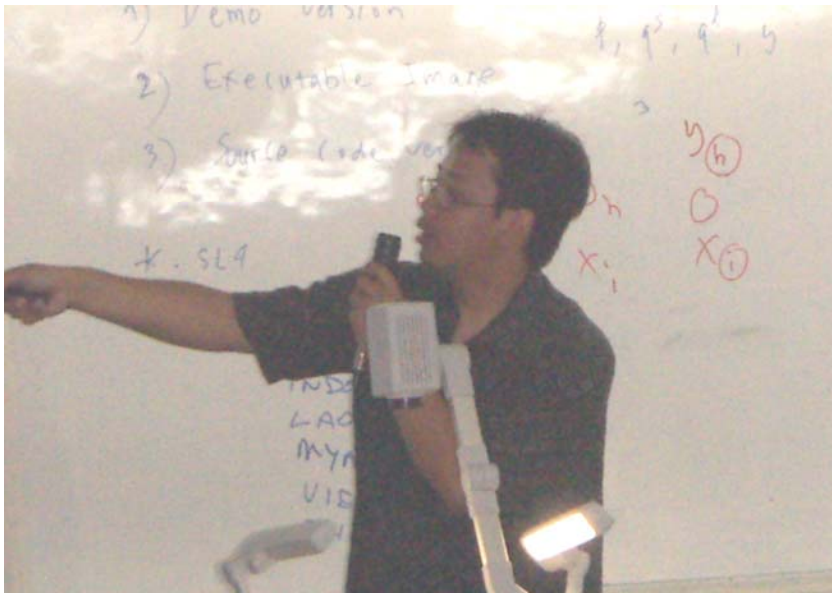
Peter Warr lecturing in CGE Modelling class



Students work hard in the lab sessions



Dr Rina Octaviani teaches students on GTAP Modelling



Arief Yusuf lecturing in CGE Modelling class



Will Martin gives lecture on the WITS agricultural trade data base



Class photo

CGE MODELLING CLASS PROGRAM

Chulalongkorn University

12-21st December, 2005

Day	Session	Event/lecture	Taught by whom
Day 1, Tuesday 13 Dec.	Morning	The meaning of general equilibrium modelling	Peter Warr
		The mathematics of linearization	
		Introduction to GEMPACK	Arief Yusuf
	Afternoon	Using GEMPACK: coding up the model building the data base	Arriya Mungsunti Arief Anshory Yusuf Philip Liu Dang Duc Anh
Day 2, Wednesday 14 Dec.	Morning	A simple General Equilibrium Model of the Laos economy - Modeling production in GE models	Peter Warr
	Afternoon	Using GEMPACK: Writing up a simulation file (.CMF) Checking model consistency through simulation	Arief Anshory Yusuf Arriya Mungsunti Philip Liu Dang Duc Anh
Day 3, Thursday 15 Dec.	Morning	Modeling consumer demand in GE models	Isra Sarntisart
	Afternoon	Using GEMPACK: Conducting a policy simulation	Arief Anshory Yusuf Arriya Mungsunti Philip Liu Dang Duc Anh
Day 4, Friday 16 December	Morning	Putting the GE model together - market clearing - model closure Understanding the	Peter Warr

		Social Accounting Matrix Modeling poverty and inequality	
	Afternoon	Using GEMPACK: Understanding the policy simulation	Arief Anshory Yusuf Arriya Mungsunti Philip Liu Dang Duc Anh
Day 5, Sunday 18 December	Morning	World agricultural trade issues The WITS agricultural trade data base	Will Martin
	Afternoon	Using the WITS data base	Philip Liu Dang Duc Anh
Day 6, Monday 19 December	Morning	The GTAP model of the global economy Overview of GTAP Applications of GTAP Accounting relationships Price linkage equation	Rina Oktaviani
	Afternoon	Using GTAP: Data base of GTAP: data aggregation issues Trade data in GTAP Protection data in GTAP	Rina Oktaviani Arief Anshory Yusuf Arriya Mungsunti Philip Liu Dang Duc Anh
Day 7, Tuesday 20 December	Morning class session	The GTAP model of the global economy: Producer behaviour Household behaviour Final demand	Rina Oktaviani

		Macroeconomic structure of GTAP Standard closure Welfare decomposition	
	Afternoon	Using GTAP: Simulation of tariff reduction Analysing the results	Rina Oktaviani Arief Anshory Yusuf Arriya Mungsunti Philip Liu Dang Duc Anh
Day 8, Wednesday 21 Dec.	Morning	Interpreting and using the results of GE models	
	Afternoon	Using GEMPACK: wrap-up session	Arief Anshory Yusuf Arriya Mungsunti Philip Liu Dang Duc Anh

CGE MODELLING CLASS PARTICIPANTS

<i>Name</i>	<i>Gender</i>	<i>Institution</i>	<i>Position</i>	<i>Address</i>	<i>Contact details</i>
China					
Professor <u>Lei Ming</u>	M	Peking University	Chair	Department of Management Science and Engineering, Guanghua School of Management, Peking University, Beijing 100871, CHINA	Tel/Fax: (86-10) 6276 7993 Email: leiming@gsm.pku.edu.cn
Dr <u>Wu</u> Laping	M	Institute of Agricultural Economics	Associate Professor	College of Economics and Management China Agricultural University 2 Yuan-Min-Yan Xi Lu Hai Dian District Beijing 100094	Fax: 86 10 6289 3129 Email: wlping@cau.edu.cn wulaping@hotmail.com wulp2005@sina.com
Mr. Hai <u>Lin</u>	M	CCAP		Center for Chinese Agricultural Policy, Building 917, Datun Road Anwai, Beijing 100101, China	Fax: 86 10 6485 6533 Email: linh.ccap@igsnr.ac.cn
Mr <u>Yu</u> Liu	M	CCAP		Center for Chinese Agricultural Policy, Building 917, Datun Road Anwai, Beijing 100101, China	Fax: 86 10 6485 6533 Email: linh.ccap@igsnr.ac.cn

Thailand					
Thepnarong Noppagornvisate	M	Biotec	Policy Research Assistance (Economics)	National Science and Technology Development Agency, National Center for Genetic Engineering and Biotechnology, 113 Paholyothin Road, Klong 1, Klong Luang Pathumthani 12120 Thailand	Fax: 662 564 6703 Email: Nthep@biotec.or.th
Ms Watcharin Meerod	F	Biotec		National Science and Technology Development Agency, National Center for Genetic Engineering and Biotechnology, 113 Paholyothin Road, Klong 1, Klong Luang Pathumthani 12120 Thailand	Fax: 662 564 6703 Email: watcharin@biotec.or.th
Ms Sawarai Boonyamanond	F	Chulalongkorn Uni		Faculty of Economics, Chulalongkorn University, Phayathai Road, Khet Pathum Wan, Bangkok 10330, Thailand	maymae_sb@hotmail.com
Ms Sureporn Kokilanon	F	Chulalongkorn Uni		Faculty of Economics, Chulalongkorn University, Phayathai Road, Khet Pathum Wan, Bangkok 10330, Thailand	may 2805@hotmail.com
Ms Piyanuch Wuttisorn	F	NESDB, Thailand			piyanuch@nesdb.go.th
Ms Isriya Bunyasiri	F	NESDB, Thailand			isriya@nesdb.go.th
Ms Apirada Chinprateep	F	NESDB, Thailand		office: 02 280 4085, cell: 01 825 8714	apirada@nesbd.go.th
Mr Krisada Bamrungwong	M	Chulalongkorn University, Thailand			kris_krisada@hotmail.com
Ms Weranuch Wongwatanakul	F	Chulalongkorn University, Thailand			nuchienuch@hotmail.com
Mrs Kanchana Sripruetkiat	F	KU		02-561-3467 ext121	fecokns@ku.ac.th
Ms Waleerat Suphannachart	F	KU			fecowrs@ku.ac.th

Indonesia					
Dr Budiman <u>Hutabarat</u>	M	CASEPS	Senior Reseacher	Indonesian Center for Agricultural Socioeconomics and Policy Studies (CASEPS), Ministry of Agriculture, Jalan Ahmad Yani No. 70, Bogor 16161 Indonesia	Fax: 62 251 314 496 email: caser@indosat.net.id
Dr Bambang <u>Irawan</u>	M	CASEPS	Senior Reseacher	Indonesian Center for Agricultural Socioeconomics and Policy Studies (CASEPS), Ministry of Agriculture, Jalan Ahmad Yani No. 70, Bogor 16161 Indonesia	Fax: 62 251 314 496 email: caser@indosat.net.id
Ms Titik <u>Annas</u>	F	MoT	CSIS researcher	Ministry of Trade, JI Ridwan Rais No. 5 Blok I, Jakarta Pusat, Jakarta 10110, Indonesia	62 21 344 0060 tanas@csis.or.id
Ms Yati <u>Nuryati</u>	F	MoT	TREDA researcher	Ministry of Trade, JI Ridwan Rais No. 5 Blok I, Jakarta Pusat, Jakarta 10110, Indonesia	62 21 344 0060
Ms Yeti Lis <u>Purnamadewi</u> , Ir MSc	F	IPB	Department of Economics	Faculty of Economics and Managment Bogor Agricultural University, Jalan Raya Pajajaran, Bogor 16114, Indonesia	Fax: 62 251 626 602 Email: care of Rina (r_oktavi@indo.net.id)
Ms Wahida Maghraby	F	CASEPS	Junior Reseacher/Coordinator Collaborative Research	Indonesian Center for Agricultural Socioeconomics and Policy Studies (CASEPS), Ministry of Agriculture, Jalan Ahmad Yani No. 70, Bogor 16161 Indonesia	Fax: 62 251 314 496 Email: wahida@indosat.net.id

Vietnam					
Ms <u>Pham Lan Huong</u>	F	CIEM	Deputy Director	Department for Trade Policy and International Integration Studies, Central Institute for Economic Management, 68 Phan Dinh Phung Street, Hanoi, Vietnam	Fax: +84 (4) 8456795 Email: plh@ciem.org.vn
Ms <u>Tran Binh Minh</u>	F	CIEM	Senior Researcher	Department for Trade Policy and International Integration Studies, Central Institute for Economic Management, 68 Phan Dinh Phung Street, Hanoi, Vietnam	Fax: +84 (4) 8456795 Email: care of above
Mr <u>Pham Minh Tri</u>	M	IAE	Vice Head of Market and Commodity Division	Institute of Agricultural Economics, No.6 Nguyen Cong Tru, Hanoi, Vietnam	Fax: 84 4 9711062 Email: vktnn@fpt.vn pmtri@netnam.vn
Ms <u>Pham Hoang Ngan</u>	F	IAE	Researcher of Information Centre	Institute of Agricultural Economics, No.6 Nguyen Cong Tru, Hanoi, Vietnam	Fax: 84 4 9711062 Email: plhciem@gmail.com phamhoangngan_christmas@yahoo.com
Myanmar					
Ms Thi Da Myint	F	c/- ANU		ANU	
Ms Nilar Aung	F	c/- ANU		ANU	
Laos					
Mr <u>Oulaysone Senesavath</u>	M	Tax Department, Ministry of Finance		Phonexay Road Vientiane, Laos PDR.	
Mr <u>Sinxay Phetsavong</u>	M	Tax Department, Ministry of Finance		Phonexay Road Vientiane, Laos PDR.	
Mr <u>Leangxay Lithideth</u>	M	Price Goods Administration Division, Ministry of Finance		Phonexay Road Vientiane, Laos PDR.	

SUMMARY AND ANALYSIS OF PARTICIPANTS' FEEDBACK

Feedback was sought from participants by circulating a questionnaire with 13 questions, for return by the end of the Class.

1. What do you think is the most important thing you have learned from the Class?

Some of the responses to this question included:

- Knowledge of how to use Gempack software in CGE Modelling. This included both learning how to use the software as well as its application.
- Developed a greater understanding of the theoretical concepts of CGE and GTAP Modelling
- The importance of CGE and GTAP Modelling in the development of economic policy
- Systematic thinking on the cause and effect that various scenarios have on economic theory
- Framework and structure of the General Equilibrium Model
- How to interpret the results
- Potential collaboration with others
- Introduction to WITS database

2. What were the two most important aspects of the Class activities for you?

- **Lectures**
- **Laboratory sessions**
- **Meeting with other participants of similar interests**
- **Something other than the above – give details**

The lectures and lab sessions were clearly viewed as the 2 most important elements of the class activities. The lectures helped with the theory and the lab sessions provided assistance with practical application. There were some participants who also mentioned that they found it very helpful to meet and learn from fellow participants and their experiences.

3. Did you have any language problems? If so, please give details.

There were mixed responses to this question. About two thirds of the responses mentioned that they had no problems. Of those that said they did their difficulties included a) understanding the English in classes where the mother tongue of the speaker was not English 2) the speed at which the lectures were delivered made it hard for some to follow and 3) technical terms were difficult to understand. One comment pointed out that they found the workshops helpful because what they had not understood in the lectures was later explained in the lab in their own language.

4. Did you find anything missing from the Class? If so what would you have liked to have been included?

Items nominated included:

- A number of participants commented that the time spent on GTAP was too short and therefore difficult to understand. One suggestion was that CGE and GTAP should be two separate classes and the time expanded.
- More exercises on GTAP-problem solving type and more on the implications of this model.
- More systematic teaching in the lab session
- Discussion of the results from the lab session
- Test (for certificate) and to make sure that participants have understood the concepts being taught
- A session that encourages participants to relate the theoretical knowledge gained from the training courses to their own country's situations.
- It is difficult to construct the model without any background in CGE modelling
- Record the lectures and put them up on the website
- More explanation on the "mechanism" of the model and less on the mathematical formulas
- How to combine all the data sources (WITS, GTAP, SAM) in CGE Modelling
- An explanation of how to link GTAP and GEMPACK (CGE Modelling) and how to apply it yourself
- Encourage more interaction between participants from various countries
- There were a couple of requests for more discussion. Although time was given for discussion very little discussion actually took place. It seems that discussion in a large group may not suit the Asian context as well as it does in Australia. Breaking into small groups was requested and this may encourage more lively discussion in future.

5. What was your opinion of the class notes?

The comments on the notes were mostly all very positive and participants found that because the notes were good they were able to understand the lectures better and were able to focus on the lectures rather than having to take notes. A few small suggestions were that:

- The folder that was provided was too small for the notes that ended up being distributed.
- One participant mentioned that they found the GTAP notes more difficult to understand than the rest of the notes
- A couple of participants also suggested that where the slides were dark they did not print as clear

6. How has your understanding of CGE Modelling changed as a result of the class?

All participants who completed this question wrote that their understanding of CGE Modelling had increased as a result of the course, some substantially. Some mentioned that prior to the course they had little or no understanding of CGE Modelling and now felt that they had a much clearer understanding of the concepts. Others felt that what they learnt showed them how valuable CGE Modelling was in analysing policy impacts. Others pointed out that they found that the lab sessions had helped them significantly in grasping the concepts taught in the lectures. One participant did mention that they found the course time too short to be able to grasp the concepts being taught.

7. Has the range of your professional contacts changed as a result of this Class? If so please describe what has happened.

Many participants felt that they had developed important contacts with fellow participants from other countries and felt that they could learn from the experiences of participants from different countries. However, some answered no to this question and one comment even specified that there was little mixing between Thai and non-Thai participants. This may have resulted from having so many Thai participants attending the course.

8. What should be done now to reinforce the activities of this Class?

The major response by far was formation of networks, talking between each other, working on research projects together and exchanging emails. Others felt that a second round of meetings to follow up on progress would be appreciated.

9. Were the accommodation, meals and general arrangements appropriate? If not, could you provide details?

The accommodation, meals and other arrangements were generally praised and many commented on the delicious lunches and morning and afternoon teas which we ate together each day. One person commented that it was too hard to make international calls or gain Internet access from the hotel; another commented that they felt single occupancy in the hotel would have been better and that a separate allowance for taxis to and from the airport in Bangkok and in their home country would have been preferable (we included money to cover this in the allowance paid to participants). There was also a request for an end of class party.

10. If we ran the Class again, what changes would you recommend?

The responses to this question included:

- More time in the computer lab so more time to practise
- The lab sessions should provide a revision of what has been learnt in the lectures before launching into use of the computer
- Distribute notes to students prior to the class so that they can preview and familiarise themselves with the content.
- For the GTAP section a number of participants commented that this section covered too much ground in too short a time and was difficult to understand. They suggested that more exercises on GTAP would have been good and even to teach GTAP as a separate course so as not to confuse the two models.
- Need more linking of GTAP and GEMPACK
- No classes on weekends
- The airconditioning was too cold (this is a common problem in Asia as they seem to only have off and freezing as options for airconditioning).
- One participant suggested that a more comprehensive course including programming, database aggregation or disaggregation would be preferable.
- One participant requested a share-license for the software so that they could use what they have learnt when they returned home. Unfortunately a share-license will not cover persons from different institutions.
- More small group discussion.
- A Thai participant recommended the course be held out of the city so that bosses of host country participants cannot call them back to the office during the course.
- A request for clear instructions regarding how much allowance and details for reimbursement of ticket (this information was provided in an attachment, however, the number of questions we received in regard to this information after the email was sent suggests that not all participants read such attachments and it should have been included again in the handouts).

11. How do you propose to pass on the information you have learned to your colleagues in your home institution?

Most of the participants said that they would run a small workshop, lecture, seminar or training session to share what they had learnt with interested colleagues, directors and students. At least one participant was required to give a written report to their director.

12. Will it be difficult to implement the knowledge you have learned from the Class into your work activities in your home institution? If so, can you provide details?

Some of the participants expressed confidence in being able to apply what they had learnt into their contexts at home. However, other participants expressed

concerns including the cost of the Gempack software which would be prohibitive for many of their institutions, problems with accessing an adequate and up-to-date database for their country, and difficulties they may face reapplying what they had learnt to their own country's context.

13. Are there any comments you would like to make that are not included in items 1 - 11 ?

The majority of the comments given in this question had been included elsewhere. A couple of participants took this opportunity to express their appreciation of Professor Warr and the speakers for their lectures, the assistance of the team in the lab sessions and the support of the administrators. One of the participants recommended that assigning participants the task of presenting a paper which would be marked would increase the commitment of the participants to the task as well as encouraging teamwork. A further comment was that the course was too short and would prefer two weeks or more rather than just 8 days of training.