Australian Productivity Commission
Activities during 1999 are focused on preparing a comprehensive analysis of barriers to services trade, to be presented at the World Services Congress in Atlanta on 1-3 November. An abstract of the proposed paper is attached. The key tasks are:

- to estimate the tax or tariff equivalents of barriers to services trade;
- to extend the GTAP database so that it records services traded via commercial presence (ie via FDI), as well as services recorded in conventional balance of payments accounts - essentially this involves building up a database of the costs and sales structures of offshore affiliates;
- to inject the tax or tariff wedges into the appropriate parts of the database - the abstract spells out how this will be done;
- to extend the theory to handle international capital mobility via FDI - using the key insights from Peter Petri and methods pioneered by Rob McDougall for the Salter model - and modifying the welfare decomposition accordingly; and
- to conduct an analysis of liberalisation of services trade, hopefully with an eye on the next round of WTO negotiations.

The measurement of barriers to services trade is being conducted jointly with the Australian National University (Tony Warren and others) and the University of Adelaide (Christopher Findlay). The modelling is being dome within the Productivity Commission. In addition, we have been scoping ways in which our efforts may help the next version of the GTAP database. Our thoughts on the issues raised by Rob McDougall with the GTAP services working group are as follows.

Proposed services sector classification
This is more ambitious than previously indicated - we are delighted. We are particularly pleased that the proposal includes separating business services nec from recreational and other (personal?) services.

International margins usage
A report prepared by the Campbell-Hill Aviation Group, Commissioned by the US National Committee of PECC, and funded by FedEx, analyses the economic benefits from full liberalisation of integrated air express service in the Asia-Pacific, with specific reference to China.

Of interest is that the report has estimates of cargo flows by mode (air, air express and other). There is also a very brief description of the methodology, which seems to impute a mode based on the unit value of the goods being shipped. It seems something equivalent could be developed fairly easily for GTAP. We have sent a copy of their report to Rob McDougall.

Barriers to trade in services
Banking services

The Productivity Commission is about to finalise the estimation of the tariff equivalent of (non-prudential) barriers to trade in banking services for 38 economies:

- each of the EU 15 plus Switzerland;
- Argentina, Brazil, Canada, Chile, Colombia, Mexico, USA, Uruguay, Venezuela;
- Australia, Hong Kong, India, Indonesia, Japan, Korea, Malaysia, New Zealand, Philippines, Singapore, South Africa, Thailand, Turkey.

The methodology is as follows. We have summarised qualitative information about barriers into a restrictiveness index (essentially a slightly sophisticated frequency measure) for each of these economies. Our sources are broader than the GATS schedules, and hopefully that much more complete.

We then do some cross-country econometric estimation to show how the 'price' of banking services (in this case measured by net interest margins) is affected by these restrictiveness indices. We can then use the coefficients on the index variables to compute a tariff equivalent for each economy, based on the level of its restrictiveness index.

The analysis could therefore be generalised to economies not in our sample. We would 'just' need to find suitable researchers who could compute restrictiveness indices for additional countries, along the lines that we have done (the method is spelt out in the paper). Our econometrics could then be used to translate them into tariff equivalents. We don't have any brilliant ideas for how to find a suitable network of researchers, other than to appeal to normal GATP contributors. But we also have our ears open for an alternative network of banking types who could help.

We plan to have completed the banking study by mid April.

Distribution services and Other business services
Once we have finished the banking study, we are going to attempt similar exercises for distribution (concentrating on wholesale and retail trade) and Other business services (concentrating on architectural and engineering services - we would have loved to have done lawyers or accountants, but their unincorporated structure makes it much harder to get data). The time frames for these studies are by May this year. Again, we will probably concentrate on the same 38 economies, given our APEC focus. But if we succeed in getting to a price wedge stage, these results could be generalised to other economies.

Insurance
We have had first crack at a restrictiveness index for insurance services already. Now that we have seen that GTAP plans to disaggregate insurance, we are planning to try an econometric exercise similar to our banking exercise. But we won't be able to get to this until next year.

Maritime
We have a gold-plated restrictiveness index for maritime services in 37 economies. This is now written up. Our original thoughts were that cabotage arrangements would dominate, so that we could then use the US estimates of the cost of the Jones Act, and generalise these to any country

with a similar cabotage arrangement. However, having reviewed the restrictions, it is clear that life is not that simple. So we have passed our restrictiveness index over to a colleague at ANU who will hopefully come up with a price and/or quantity wedge.

Telecommunications
ANU colleagues are handling this. It involves 2 approaches, both slightly different from ours. In one, they have put together a quantitative index of barriers (this time based on ITU data) and then use econometrics to estimate a 'quantity' wedge rather than a 'price' wedge. In another, they are using someone else's index of restrictions in the frontier estimation of a cost function, from which they can back out a price wedge. They should have estimates by May that we can use in a modelling exercise. The good news is that because the methodology uses indices of restrictions, it can be generalised to other economies.

Air services
Again, this is being handled at ANU. One approach involves frontier cost function estimation, but (so far) without incorporating explicit measures of the barriers (no equivalent of the restrictiveness index). The one-sided errors from such estimation can still be attributed to barriers (and any other omitted variables), but the disadvantage is that this cannot be generalised to economies not in the original sample. I have pointed this out to them. We will have to grapple with this issue by the middle of this year.

Another approach used by the Productivity Commission has been to build a network model of flights into and out of Australia, and to model the strategic games played by the airlines flying those routes (including possible moves to an open skies regime). Although this is a great way to look at specific policy initiatives, it would be very difficult to generalise.

Horizontal commitments
In the process of putting our data together, we are keeping track of horizontal commitments (eg on FDI and temporary movement of people) that affect all sectors, including those not mentioned so far. Hence they would provide a minimal basis for putting together a restrictiveness index for sectors such as recreational services, construction and transport nec. Whether we could then go from that to a price wedge on anything other than a judgemental basis remains to be seen.

Modelling barriers to services trade
We have plans to put all this together at GTAP's current level of sectoral disaggregation, and for 19 regions (mainly APEC). Because we will be modelling explicitly the services delivered via commercial presence, we will be disaggregating our price wedges into those into commercial presence and those on other modes of delivery. We assume this is not of interest for GTAP v 5.

But one other feature of interest is that for each mode of delivery, we are also distinguishing barriers that discriminate against foreigners from those that affect domestic and foreign operatives equally. Hence we will be able to have both discriminatory and non-discriminatory price wedges. We would urge you to incorporate this feature of the GATS into GTAP v 5.

Philippa Dee, Assistant Commissioner 31 March 1999

Attachment Modelling multilateral liberalisation of services trade
by Philippa Dee, Kevin Hanslow, Patrick Jomini, Susan Stone and George Verikios
Productivity Commission
PO Box 80
Belconnen ACT 2616
AUSTRALIA

This paper uses comprehensive new measures of barriers to services trade in a multi-region, multi-sectoral CGE model of world trade and investment. The model is used to examine the impact of multilateral liberalisation of services trade.

The comprehensive measures of barriers to services trade are built up from information contained in a range of sources, including country GATS schedules, APEC individual action plans, WTO trade policy reviews, Tradeport, and the USTR Foreign Trade Estimate report. Generally, the first step is to develop a 'restrictiveness index' - essentially a sophisticated frequency measure - as a means of summarizing the raw information. Wherever possible, the restrictiveness indices are used as explanatory variables in subsequent analysis to obtain a price impact measure that can be incorporated into the CGE model. The development of the restrictiveness indices and price impact measures is explained elsewhere, and is not the main focus of this paper.

For modelling purposes, the barriers affecting trade in a particular service sector, and their associated price impacts, are divided up in two ways. Firstly, barriers to commercial presence are distinguished from those affecting other modes of service delivery - cross border supply, consumption abroad, and the presence of natural persons. Service delivery via commercial presence is modelled as trade in a primary factor - capital. Service delivery via the other modes of supply is modelled as trade in sectoral output. Secondly, barriers that affect only foreign suppliers are distinguished from those that affect foreign and domestic suppliers equally. Putting the two-way classification together means that

- barriers that discriminate against foreigners delivering via modes other than commercial presence can be modelled as a 'tariff' wedge on output prices;
- nondiscriminatory barriers affecting modes of delivery other than commerical presence can be modelled as a consumption tax on output prices;
- barriers that discriminate against foreigners delivering via commerical presence can be modelled as a 'tariff' wedge on foreign capital returns, or as a tariff on goods produced by foreign-owned capital; and
- nondiscriminatory barriers affecting commercial presence can be modelled as a tax wedge on domestic and foreign capital returns, or equivalently, as a production tax.

The effects of these barriers are measured using version 4.1 of the GTAP model of world trade, modified to handle the removal of barriers to trade in services. The theoretical structure of the model is altered to allow for the movement of capital between different regions. This is a significant change to the original theoretical structure of GTAP. Capital is not, however, perfectly mobile. Just as GTAP adopts the Armington assumption for imported goods, capital

from different sources is also assumed to be imperfectly substitutable (at least in GE sense). This is partly because the costs and sales structures of foreign affiliates differ from domestic firms. It is also because investors prefer to maintain a degree of geographic diversity in their capital investments. This treatment follows the work of Petri and captures some of the features of modern treatments of foreign direct investment. The welfare decomposition contained in GTAP is also modified to allow for income earned from abroad.

The model is built up at a relatively disaggregated level - 19 regions and 50 activities. The model captures in snapshot form the effects of the policy change after a relatively long period of adjustment, typically a 10 year period. The closure reflects this relatively long time frame. As noted, capital is mobile, but not perfectly so. The level of employment in each region is fixed (at the level it would otherwise have had in the absence of the policy change), while real wages can vary. On the demand side, private household consumption, government expenditure and savings are set equal to fixed shares of gross domestic product (GDP), and investment, the trade balance and GDP are set as endogenous.

The model is used to demonstrate the importance of liberalising barriers to commercial presence in the services area. This is often because the barriers to this mode of service delivery are high, but also because not much trade takes place via other modes of supply for many service sectors. Because many services are important intermediate inputs for other business, there are expected to be strong complementarities between services trade liberalisation and trade and investment in other sectors. The model could also be used to examine a range of other trade and investment issues, including the role that investment liberalisation could play in returning capital to the Asian region in response to the Asian crisis.