
Productivity Commission — GTAP Board Summary 2000

1 Construction of the FTAP model

During the past year the Commission developed the FTAP model. The FTAP model is a 19 region, 3 sector, comparative static, computable general equilibrium model of the world economy that includes a treatment of foreign direct investment on a bilateral basis. The FTAP model was developed from the GTAP model, with the addition of the structure necessary to support the analysis of services liberalisation. A major component of this liberalisation is the removal of barriers to FDI in the tertiary sector. FTAP also includes a treatment of international capital mobility, very similar to that developed for the SALTER model by Robert McDougall, but adapted to suit the representation of FDI implemented in FTAP. Firm level product differentiation is also incorporated using the technique developed by Joe Francois.

The major tasks necessary to create the FTAP database were the generation of arrays of FDI stocks and income flows by home region, host region and sector, and the incorporation of the available estimates of barriers to services trade in the database. At the time of construction of the FTAP database, barriers for banking and telecommunications were available. These were taken as being typical of barriers to services trade generally, taking account of the degree to which services in each region are traded. These barriers were incorporated in the database as tax equivalents on capital, output and exports using the ALTERNATIVE software. The ‘taxes’ on capital represent barriers to establishment, and the ‘taxes’ on output and exports represent barriers to ongoing operations. Different ‘tax’ rates apply to domestic and foreign-owned industries. The model structure ensures that the revenues from these ‘taxes’ are divided appropriately between the government and private agents.

The FTAP model, database and documentation are available from the Commission’s web-site www.pc.gov.au, under research → publications → publications by category → economic models. For further information, contact Kevin Hanslow.

2 Measuring restrictions on trade in services

The Commission, in collaboration with the Australian National University and the University of Adelaide, has been measuring the price effect of restrictions on trade in services for up to 38 economies in a number of sectors. The work mainly covers countries in Europe, Asia, and North and South America.

Measuring restrictions on trade in services involves:

- developing an index to measure restrictions on services, based on coverage and some initial judgement about the relative restrictiveness of the different sorts of restrictions;
- applying the index and calculating restrictiveness index scores for economies;
- developing an econometric model to measure the determinants of the economic performance (eg price, profit margin, cost, or quantity) of service firms in different countries, taking account of all the factors that economic theory would suggest to be relevant, including our index measure of trade restrictiveness;
- estimating the determinants of the performance of service firms, wherever possible entering the components of the trade restrictiveness index separately so that the econometrics can tell us something about the relative weights attached to the separate components; and
- using the results of the econometrics to calculate the effect of trade restrictions on performance, where necessary converting a quantity or a profit effect into a comparable price or cost effect.

The restrictiveness index, a sophisticated frequency measure, uses available information on regulation to quantify the extent to which comparable economies have more or less restrictive trading regimes for services. It is a summary measure of the nature and extent of restrictions on services. Information on restrictions has been drawn from a number of sources, including APEC, OECD, WTO and USTR.

The restrictiveness index calculates a ‘foreign’ and ‘domestic’ index score. The foreign index covers all restrictions on foreign service providers to enter and/or operate in a domestic market. The domestic index covers all restrictions on domestic service providers or restrictions that are applied equally to foreign or domestic service providers — limitations on market access. The difference between the foreign index score and the domestic index score is a measure of discrimination against foreigners — limitations on national treatment.

The restrictiveness index scores and price effect measures are split by restrictions on establishment (eg ownership and licensing restrictions, restrictions on the permanent movement of people) and ongoing operations (eg restrictions on

promotional activity, restrictions on the temporary movement of people) for foreign and domestic service providers.

In principle, trade restrictions could have one of two effects — they could create rents by raising prices above average cost, or they could create inefficiencies by raising costs above what they otherwise would be. Where studies use profit margins or costs as their performance measure, they are able to give some direct guidance on which of these effects occurs. Where studies use price or quantity measures, some judgement is required.

Completed work

The research team has calculated restrictiveness indexes and price effect measures for trade in banking and telecommunications services, as well as a restrictiveness index for maritime. A summary of this work is included in the Commission's *Trade and Assistance Review 1998-99*. Chapter 2 of the report provides restrictiveness index scores and price effect measures split by restrictions on establishment and ongoing operations for up to 38 economies. The report can be found at (<http://www.pc.gov.au/research/annrpt/tar9899/index.html>).

Note that estimates of price effects for additional countries could be calculated by collecting qualitative information on their trade restrictions and plugging it into the existing index framework, then applying the existing econometric coefficient estimates to the resulting index score. (In the case of telecommunications, estimates already exist for many more countries than the 38 reported above.) We have started giving some preliminary thought to whether the WTO's Trade Policy Review Mechanism could be harnessed to collect the raw information. As a first step, we hope to trial such a collection among APEC economies for information on barriers to education.

Ongoing work

The Commission is working on:

- restrictiveness indexes for trade in distribution (wholesale and retail trade), the professions (legal, accountancy, architectural, engineering), and health and education services; and
- price effect measures for distribution and engineering services.

Our ANU colleagues are working on:

- a price effect measure for maritime and a cost effect measure for aviation.

At the completion of this work, the research team will have measures of restrictions for major services sectors of countries in major regions of the world.

For further information, contact Greg McGuire, Duc Nguyen-Hong, Kaleeswaran Kalirajan and James Mills.

3 Quantifying the sectoral effects of liberalising trade in services

This project analyses the barriers to services trade at a *detailed sectoral* level, and has been submitted for presentation at the 2000 Global Economic Analysis Conference. An abstract of the proposed paper is attached. The key tasks are:

- to split the existing foreign direct investment (FDI) stocks and returns in the FTAP database from three sectors (primary, secondary and tertiary) to nine sectors (one primary, two secondary and six tertiary sectors);
- to split the tertiary sector in the existing GTAPICM post-Uruguay database, into the same aggregation as described above. This will require the use of service sector shares from the preliminary version of GTAP 5;
- to inject the tax or tariff wedges into the appropriate parts of this database, using the ALTERTAX procedure;
- to split the capital stocks, inputs, returns on FDI, and taxes on returns to FDI, between domestic and foreign owners using the shares generated in the first step; and
- analyse services trade liberalisation scenarios, with a view to identifying priorities for the next round of GATS negotiations.

The barriers to trade in services will be sourced from work being done within the Commission and at the Australian National University. The intention is to use a 10 region aggregation (Australia, New Zealand, Japan, NIE (South Korea, Singapore, Hong Kong and Taiwan), ASN (Indonesia, Malaysia, Philippines and Thailand), China, Canada, United States, European Union and the rest of the world.). As with the FTAP project, by explicitly modelling the services delivered via commercial presence, we will be disaggregating our price wedges into those on commercial presence and those on other modes of delivery. Further (as in FTAP), 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.

For further information, contact Patrick Jomini, George Verikios and Xiao-guang Zhang.

4 Assessing domestic regulation in service industries — Electricity

The Commission has recently commenced a project characterising domestic regulatory regimes affecting international trade (primarily via commercial presence) in electricity markets. It was felt that a characterisation of domestic regulation had been an important ‘missing variable’ in the previous work, especially for infrastructure industries. The electricity study will be one of a suite of studies with our ANU colleagues designed to look at this general issue over the next three years.

While in its infancy, the electricity project will hopefully:

- identify best practice electricity regulation;
- identify impediments to competition in various countries by comparing their regulations structures to best practice regulation;
- compute competition restrictiveness indices (akin to the trade restrictiveness indices used by the Commission in earlier projects on maritime, banking and finance, foreign investment, distribution and the professions); and
- relate these indices to economic outcomes using econometrics, data envelopment analysis or stochastic production function techniques.

Information availability and time constraints (the project is scheduled to be completed by October this year) will determine the country coverage, but will hopefully include countries from North and South America, Europe, Asia, Oceania and possibly South Africa.

For further information, contact Owen Gabbitas, Greg McGuire and Samantha Doove.