

SEMINAR PAPER 97-10

**MEASURING TRADE IMPEDIMENTS TO
SERVICES WITHIN APEC**

**Malcolm Bosworth, Christopher Findlay, Ray Trewin
and Tony Warren**

**CENTRE FOR INTERNATIONAL
ECONOMIC STUDIES**

**University of Adelaide
Adelaide S.A. 5005
Australia**

September 1997

CIES SEMINAR PAPER 97-10

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**Malcolm Bosworth
Industry Commission**

**Christopher Findlay
University of Adelaide**

**Ray Trewin
Australian National University**

**Tony Warren
Australian National University**

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Revised version of a paper presented at the Symposium on Evaluating APEC Trade Liberalization: Tariff and Nontariff Barriers U.S. International Trade Commission, Washington DC, September 11-12, 1997. Funding for the project of which this paper forms a part was provided by an Australian Research Council Collaborative Grant and the Industry Commission. A final version of this draft paper will be prepared following the Symposium for publication by the USITC. The authors acknowledge the research assistance of Gerard Durand and the general contribution of another team member from the Industry Commission, Greg McGuire. The views expressed in this paper are those of the authors and should not be attributed, or taken as representing the views of the Industry Commission.

ISBN 0 86396 343 9

ABSTRACT

Measuring Trade Impediments to Services within APEC

Malcolm Bosworth, Christopher Findlay, Ray Trewin and Tony Warren¹

The measurement of impediments to trade in services within the APEC region is addressed in this paper. This work builds upon major methodological and practical issues encountered in measuring such impediments in the 1995 PECC Survey of Impediments to Trade and Investment in the APEC Region. Conceptual and measurement issues in deriving partial equilibrium estimates of the effects of service trade impediments are discussed. The feasibility and use of partial estimates, especially price-impact measures, as a means of benchmarking competitive outcomes is examined. A current joint research project involving the Australian National University, the Australian Industry Commission and the University of Adelaide will be drawn upon in which a seven step approach is being developed to identify, evaluate and measure the impact of Australian impediments to services trade. Australia's telecommunications sector is used as a case study of how to measure the domestic economic efficiency gains of regulatory reforms. Some important areas for future work, including the important link to services trade of foreign direct investment controls, are highlighted. Such work should be of interest to economic modellers as it will provide some insights into how partial measures of impediments can be constructively used to model the economic gains from trade liberalisation of services within APEC.

Keywords: Services trade, APEC, GATS, trade impediments
JEL Codes: F13, F14, L8

Contact Author:

Christopher Findlay

School of Economics

University of Adelaide

Adelaide 5005

Australia

Phone: +61 8 8303 5756

Fax: +61 8 8303 4394

cfindlay@economics.adelaide.edu.au

¹ Malcolm Bosworth is a Director, Industry Commission; Dr Christopher Findlay is an Associate Professor, the University of Adelaide and an Associate of the Australia-Japan Research Centre (AJRC), Research School of Pacific and Asian Studies (RSPAS), the Australian National University (ANU); Dr Ray Trewin is a Fellow, Economics Division, RSPAS, ANU; and Dr Tony Warren is a Post-Doctoral Fellow, AJRC, ANU and also works part-time for the Industry Commission. The Industry Commission is a statutory body that provides the Australian Government with independent advice on microeconomic reform including on areas of trade and industry assistance. It has recently amalgamated with two other bodies to prepare for the formation of the Productivity Commission, legislation on which is currently before Parliament.

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Introduction

The research reported in this paper had its genesis during a Survey of Impediments to Trade and Investment in the APEC Region undertaken in 1995 (PECC 1995). It was shown in this Survey that although the service sector was growing rapidly in APEC, there was a high level of trade and investment impediments affecting service industries within the APEC region. This was the situation despite significant moves in some economies to deregulate and liberalise certain service industries in a bid to improve levels of efficiency and quality.

The importance of these impediments to services trade and investment within APEC led to the development and funding of an Australian Research Council proposal to investigate the issue for major Australian service industries in a collaborative study between the Australian National University, the Australian Industry Commission, and the University of Adelaide. Although it has an Australian focus, the study involves international comparisons and thus has international relevance. The three year study began earlier this year and, in conjunction with developing a general approach to measuring the impact of impediments to trade in services, it is planned to examine in detail three service industries per year. Currently the important input service industries of telecommunications, aviation and finance are being examined. The first of these industries is used in this paper as a case study of the general approach to measuring these impediments.

Before discussing the telecommunications case study, the preferred approach to measuring services impediments is developed. Early sections discuss in turn the chosen broad definition of a service impediment, the identification of a comprehensive listing of such impediments, and approaches to measuring and analysing the impact of impediments to services trade. There will be a focus on the preferred approach of a price-impact measure developed from the 'bottoms up', that is impacts allocated to specific impediments. This approach is distinct from a 'tops down' approach where unidentifiable price differences between the services examined and a 'benchmark' service are not attributed to specific impediments. The important impact of Foreign Direct Investment (FDI) restrictions on services trade is discussed in a separate section.

Defining Impediments to Services Trade

A number of preliminary concepts need to be defined before considering measurement of trade impediments to services. For example, what is actually meant by services? Services tend to be defined broadly, for example as the residual economic activity that is neither manufacturing nor agricultural production, and more concretely as 'invisibles'. A more precise definition is 'an activity that adds value either directly to another person or to a good belonging to another person' (Warren 1996). Key service industries include transport, telecommunications, banking, insurance, media, utilities, retail, education, consulting and the professions.

Taking this broad definition, services are an important and fast growing component of the Australian and other APEC economies. This growth has many facets — as a share of GDP, employment, and of trade and investment (see Figures 1-3 taken from PECC 1995). Services comprise over 70 per cent of GDP, and generally a greater proportion of

employment, of some advanced APEC economies, such as the United States, and over 25 per cent of key developing APEC economies, such as China. Non-factor services trade makes up between 15 to 25 per cent of all trade in APEC economies, and a greater proportion of FDI, being between 10 and 55 per cent of all inward investment. The growth has been driven both by demand, in line with the rapid development of many APEC economies, and by supply with technological advances increasing the range of available services, especially in relation to information technology. Their importance is magnified by the fact that they are an essential input to many other important activities, including goods trade.

What are the impediments to trade in services? The definition chosen of an impediment to trade in services concerns a 'comprehensive set of service related measures that distort an economy's efficient allocation of resources, including those that may cause an increase in the volume of trade and investment'. It was pointed out in PECC (1995) that all such definitions will have limitations. Explicit definitions may be avoided by using a list of impediments developed by international institutions such as UNCTAD but this may miss some newly developed impediments and would not provide the conceptual basis for measuring their impact. The key point is that whatever approach is used, the coverage of impediments must be comprehensive, covering not just border measures. Thus they should cover all modes of supply and incorporate, for example, those to investment measures that may impinge on the efficiency of service delivery. Moreover, discrimination in the treatment of foreign and domestic firms need not be an aspect of a service impediment — concepts concerned with market power and competitiveness have strong relevance.

The multilateral General Agreement on Trade in Services (GATS) applied a four part typology based on how international transactions in services can be accessed, namely:

- cross-border flows;
- movement of a consumer to a supplier's economy;
- movement of a commercial organisation to the consumer's economy; and
- movement of an individual supplier to the consumer's economy.

Free trade and investment in services is where service providers and consumers are able to interact through whichever mode they decide, free of any regulatory distortions. Any policy that impedes service producers and consumers interacting through any of these modes of supply is an impediment to international service transactions. Following Part III of the GATS, impediments may either violate national treatment or limit market access.

[see end of document for Figures 1 - 4.]

The GATS does not define market access. Article XVI (1) obliges members to grant market access to scheduled industry sub-sectors, while Article XVI (2):(a)-(f) contains a list of quantitative measures considered to be limitations on market access. Article XVII (1) defines national treatment as treatment no less favourable than that accorded to like domestic services and service providers subject to the limitations and conditions set out in the country's schedule of commitments. An uncomfortable overlap exists between the two commitments, with national treatment being interwoven with market access. Despite this confusion, it appears that the GATS application of market access was applied to broadly cover barriers to both foreign and domestic suppliers, that is competition policy (Snape and Bosworth 1996, Mattoo 1996).

As can be appreciated from the above, the chosen definition of an impediment to trade in services is broader than such international approaches, covering more than border measures and perhaps more than discrimination through market access and national treatment.

What are some measures of impediments to services? There are three basic approaches to measuring service impediments as just defined, namely quantity-impact type measures which compare trade volumes with and without the impediments; frequency type measures such as coverage indices (PECC 1995); and price-impact type measures which examine the impact on domestic prices of the impediments. These latter measures would include cost comparisons when aspects such as rents make price comparisons difficult.

There are difficulties with all these approaches, for example quality differentials between services adversely affect all the measures. The quantity-impact measures face substantial data limitations, in particular the lack of bilateral services trade data and the highly aggregated nature of current account data.

Data difficulties on the extent of impediments that limited the derivation of frequency type measures have been overcome to some limited extent by the availability of the GATS. This was achieved by classifying the commitments into three categories corresponding to:

- (1) the absence of restrictions either on national treatment or market access for a nominated sector for each mode of supply;
- (2) no commitment for a given sector/mode of supply; and
- (3) remaining restrictions for a sector/mode of supply that otherwise is bound by the GATS.

For quantification purposes these categories could be allocated values such as 1, 0 and 0.5 respectively then aggregated across economies and sectors to determine frequency measures (see Hoekman 1995). Examples of such measures are given in Figure 4 taken from PECC (1995). Here the indicators of the absence of service sector commitments are plotted under two assumptions, namely that industries not listed by economies are either impeded or open. Under either assumption the APEC impediments to services trade appear to have the potential to be substantial — even the most open of services (computer and tourism) having over 50 per cent of their markets suffering some form of impediment under the assumption that those not listed are

impeded. The situation is much worse for the traditionally highly regulated and hence highly restricted services of postal, basic telecommunications, transport, health and social services. The situation improves generally across the board under the assumption that those not listed are open, apart from industries such as insurances where all economies listed their policies explicitly and the situation did not change much under both assumptions. The results under the two assumptions give an indication of the potential gains from making the GATS more definite. Generally the richer APEC economies tend to have more open services although there are some sectors that are closed in all economies.

However, frequency measures are inherently limiting, measuring the extent of impediments rather than their impact. One service industry may have the same frequency of impediments but the type of impediments and the industry to which they are being applied can have a substantial effect on the impact they have on trade. Moreover, frequency measures cannot be easily compared with traditional tariff measures in cross sector comparisons.

The focus of the remainder of this paper will be on the preferred price-impact measures, although, as already mentioned, this may entail comparison of the associated costs underlying the prices. It may also entail the use of some quantity-impact measures such as quotas when these are more readily available and can be incorporated more easily into models that can provide the required impact measures in terms of resource allocation and associated measures of social welfare.

Identifying and Measuring Impediments to Services Trade

The approach to measuring impediments to trade and investment in services involves seven steps, each of which is detailed below:

1. *Definition of service industries to be analysed*

In order to maintain some degree of comparability across economies the UN Central Product Classification (CPC) has been used as the starting point for industry definition, as this was used in the GATS. However, there are various problems associated with using product rather than industry classifications. For example, many government policies apply to industries (e.g. banks) rather than services (e.g. deposit taking). Hence, the CPC categories in each of the target industries need to be concorded with industrial classifications such as the International Standard Industrial Classification (ISIC) to give a more complete picture of the industry parameters (see Table 1).

Table 1 Industry classifications and concordances

Industry	CPC	ISIC
Air Transport	73, 74, 88	621, 622, 63, 35
Finance and Insurance	81	651
Telecommunications	752	642

There is a question concerning the level of industry aggregation. Should a broad level be taken, such as insurance in general, or more specific components, such as selected insurances (e.g. car insurances), which could then be aggregated? A more disaggregated approach would be more appropriate in terms of better matching in international comparisons but could lead to difficulties in terms of allocating more general industry level common costs.

2. *Identification of the specific impediments to trade*

An essential preliminary step to measuring the impact of impediments to trade in services is to identify and establish an inventory of such impediments. This is not easy given the broad definition of impediments to trade in services chosen, for example encompassing internal regulations under competition policy and their effect on new entrants. Moreover, a key feature of impediments to trade and investment in services is that they tend to be in the form of non-tariff barriers (NTBs) such as licensing requirements, standards, outright prohibitions and so on which are less transparent and more difficult to measure. There are a large number of such NTBs as can be appreciated from the UNCTAD listing given in their database on Measures Affecting Services Trade (MAST) based on the GATS list (see Table 2). Even taking the GATS modes of supply approach results in many modes, including commercial presence.

However, the GATS does provide a starting inventory as a result of the requirement that members schedule chosen industries, and the modes of supply within those industries, in which they agree to adhere to the principles of free market access and equivalent treatment of foreign service providers. The GATS is basically a standstill agreement, rather than a schedule of commitments to future liberalisation. As such, it reflects the extent of market access and national treatment commitment of most members as of 15 April 1994. It provides a registry of service industries that have been liberalised and by default those that remained closed or where no commitments had been made. Some industries such as maritime shipping were not included in the GATS. Moreover, it is a 'positive' lists approach in contrast to the 'negative' lists approach in the EU, NAFTA and CER which requires all impediments in the covered sectors to be revealed, and do not automatically exclude new sectors from such commitments.

Again in the interest of future comparability, it has been decided that the GATS framework should provide the starting point for defining what is 'trade' in services and what are impediments to services. As such, all four modes of supply are to be included in the analysis ensuring that all impediments affecting trade and investment in services are incorporated. Furthermore, impediments to all potential entrants in the market, including both domestic and foreign suppliers (market access) and, in particular, (national treatment) are examined.

Table 2 Categories of Measures

Measures affecting market access

- a Limitations on the number of providers
- b Limitations on the total value of service transactions or assets
- c Limitations on the total number of service operations
- d Limitations on the total number of persons that may be employed in a sector
- e Measures which restrict or require specific types of legal entity or joint venture
- f Limitations on the participation of foreign capital
- g Other measures affecting market access

Measures affecting national treatment

- a Discriminatory taxes
- b Discriminatory incentives/subsidies
- c Government procurement policies
- d Local content requirements
- e Nationality, citizenship or residence requirements
- f Other measures affecting national treatment

Measures affecting MFN treatment

- a Integration agreements, as stated in Article V of GATS
- b Reciprocity requirements
- c Bilateral agreements
- d Other measures affecting MFN treatment

Non-discriminatory measures, as stated in Article VI of GATS

- a Licensing procedures
 - b Technical standards
 - c Recognition of qualifications
 - d Other measures related to Article VI of GATS
-

The identification of impediments is aided by the GATS schedules of specific commitments made by various economies. In these schedules, economies list many of their remaining breaches of market access and national treatment greatly facilitating identification of relevant impediments. However, there is some evidence that not all impediments are included. Detailed examination of the relevant legislation and regulation covering air transport, financial services and telecommunications is a necessary first step for this project. Reports by foreign governments and industry associations (e.g. EC 1996, MITI 1996, USTR 1995) have proven helpful in identifying these impediments plus business practices and other less formal impediments. Determining what impediments actually exist within a GATS framework is a useful exercise in itself.

One outstanding issue that needs to be taken into account with a sectoral approach is the various cross-sectoral impediments that exist. These include impediments such as general foreign investment constraints and policies on work visas. The effect of these horizontal impediments on each target industry needs to be factored into the sectoral analysis.

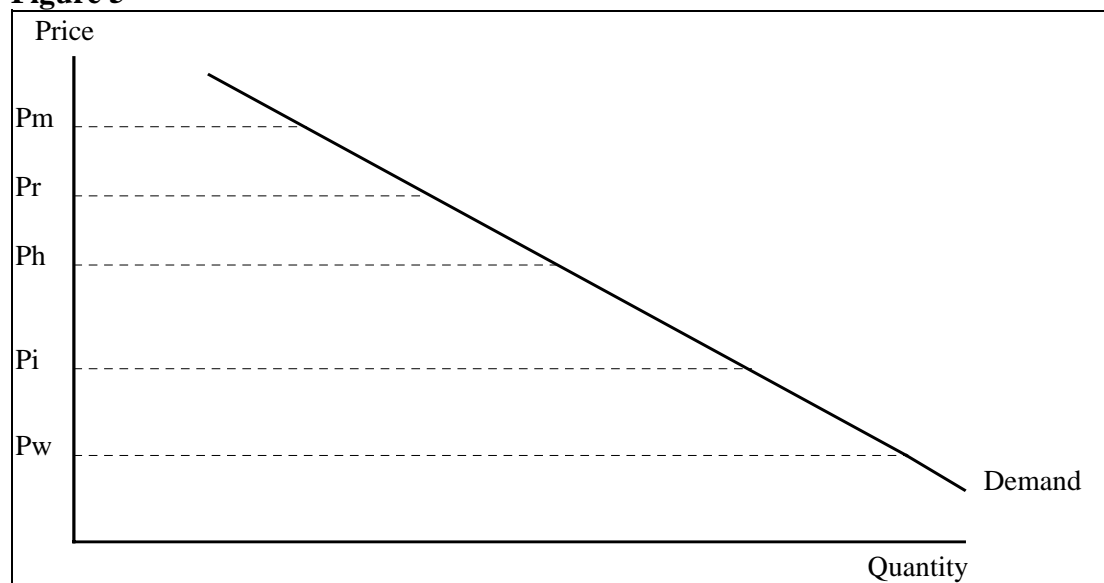
3. *Making explicit the theoretical link between the impediment and 'prices'*

A more useful inventory than that just discussed would list for each service industry the type of impediment restricting trade, classified in terms of their impact on the economics of the market. Once the impediments have been identified, the effect of the policy on actual service outcomes needs to be conceptualised. In some cases this is a relatively simple task. For example, if the impediment is a quantitative restriction or a restriction on the number of firms in a market, then it is known how this leads to higher prices. The same can be said for poor or no regulation of access to essential facilities. However, there are policies where this linkage is not so clear. One example is the effect on prices of limits on foreign investment in particular firms, as opposed to limits on all new foreign investment. This may impact upon the economics of the market, for example by constraining the introduction of new technologies, but the linkage is less clear.

4. *Determine the relevant price wedge*

Figure 5 depicts the various prices (which can also be thought of in terms of associated costs) that are relevant in determining the effect of an impediment to trade in services. In the figure, the quantity axis shows the volumes of some services such as international telecommunications. The price of the service is shown on the vertical axis. The diagram illustrates the market for this service in one economy. For simplicity, supply curves are horizontal (where marginal cost = average cost).

Figure 5



Notes: P_m = monopoly price in the home market; P_r = regulated price in the home market; P_h = competitive price in the home market; P_i = the price the best practice foreign investor can offer in the home market; P_w = the world price.

The lowest price shown (P_w) is the price at which the service can be delivered by the cheapest supplier(s) on the world market. It is assumed this service is delivered from the home base of that supplier, employing local inputs at home base prices alongside some internationally trade inputs which it can buy at world prices. It is also assumed the economy of focus is small in world market terms so the supply curve at this price is perfectly elastic. If the service is tradeable and no impediments to cross-border trade exist, the price expected to be observed in the domestic economy under examination is equal to the world price (P_w).

However, not all services are tradeable (in a cross-border sense). Therefore, to deliver its service to local consumers the world's best practice firm must invest in the local market. This may involve higher costs (e.g. labour, capital, telecommunications, transport etc) than the firm faces in its home market. These can be factored into the firm's cost function using econometric techniques. Hence the price it offers is higher than P_w , say at P_i . Therefore, if the service is non-tradeable and no impediments to foreign investment exist, the price expected to be observed in a competitive domestic economy is equal to the price the best practice foreign investor can offer in that market (P_i).

To summarise to this point, the benchmark price expected to be seen in an economy characterised by no impediments to trade and investment is either P_w or P_i , depending upon whether or not the service is tradeable.

If, however, there are impediments to trade and investment, costs and therefore prices are generally expected to be higher. But if the domestic market is relatively competitive, despite being protected from international trade and investment, the price should settle at P_h . P_h is higher than P_i or P_w , because international firms operating at world's best practice are excluded from the market. This assumes that domestic firms cannot obtain world's best practice technology.

However, suppose now that there is only one domestic supplier (e.g. due to scale economies). If that firm is not regulated and if there is also an impediment to trade in the service, the local supplier can act as a monopolist. It will set its price at P_m (determined as the price at which the profit maximising quantity of the service — set by the intersection of the marginal revenue curve and its marginal cost line — is demanded).

It may instead be the case that the domestic market is regulated and that the local firm is subject to a price cap. In this case some forms of cost padding can be expected. The reported average cost line is expected to increase to a level of say P_r . The regulated price may be at or above this level. For simplicity the former is assumed.

This model can be used to illustrate the effects of reform:

- (1) If for example, an economy decides to deregulate its market, but not to liberalise, then prices will fall from either P_m or P_r down to P_h .
- (2) If an economy then decides to allow in foreign investors, prices will fall from P_h to P_i
- (3) Finally, if an economy permits trade from the home base of foreign suppliers, then the price will fall to P_w , assuming it is tradeable.

It is the wedge between the various possible prices (or associated costs) in an economy without impediments (P_w or P_i) and the actual price (P_h , P_r or P_m) that is of greatest concern for this project. This wedge will provide the *prima facie* price-impact of the trade barriers.

5. Identify the appropriate benchmark market to measure the impact of the impediments

Once the linkage between the impediments and prices has been identified, it is necessary to find a market where such impediments do not exist to provide a benchmark against which to measure their impact. The market may either be a 'real market', such as the best practice market overseas, or it may be a 'theoretical market', such as a perfectly competitive market. Various benefits and problems are associated with whatever benchmark is chosen. In Australian telecommunications, two real and one theoretical market are available to determine the effect on prices of the duopoly on the provision of line links.

The first market that may be used as a benchmark consists of international prices for the provision of a range of telecommunications services. The advantage with this method is the availability of data. The OECD and the International Telecommunications Union (ITU) both produce extensive databases comparing tariffs or charges for various services around the world. The disadvantage with this method is that international prices may not reflect traded services, similar input costs and quality, nor liberalised prices. For example, maintenance costs for Singapore Telecom are likely to be significantly less than those faced by Australia's Telstra given the differing geography over which their respective networks operate.

The second market that may be used as a benchmark involves unimpeded domestic prices. The advantage of this method is that cost and quality differentials are no longer an issue (with some minor caveats). The problem is that aside from a few industries dependent upon essential facilities, access prices are not always available.

The third possible benchmark market — and the market that will be predominantly used in the Australian research — is the theoretical perfectly competitive market. Equal domestic and international prices do not imply there are no impediments, for example similar impediments could apply worldwide. The real interest is in efficient pricing and thus prices compared with some measure of long run marginal cost (LRMC) — a cost-price wedge. International prices or unimpeded domestic prices when they reflect a relevant LRMC could act as a proxy for these costs. The theory underlying the approach is that if the market had no impediments to entry (market access problems) then it would be competitive and prices would be expected to approach LRMC. If there are impediments, however, a cost-price wedge will exist.

The definition of LRMC used is 'the cost of keeping a particular facility alive and well in the long run (IC 1997)'. LRMC includes operating costs, normal returns on capital and some payment, say in the form of depreciation on sunk capital, to ensure continued innovation and new investment. While LRMC recovers all costs directly attributable to a particular service, it will not generate revenues necessary to meet unallocatable (common) costs such as administrative costs. The most efficient way to recover unallocatable costs is from the service with the most inelastic demand which is unlikely to be international services.

The major problems with this method are data concerns and cost padding which are currently being worked upon. The problem of cost padding is difficult to overcome because of data issues. However, in some industries the international data is available to produce a world's best practice (technically and allocatively efficient) cost function using frontier or related techniques such as Data Envelopment Analysis. These functions require a standardised output, for example costs per mainlines in telecommunications, so that analysis can be undertaken across economies. Frontier estimation usually includes estimating bundles of output characteristics. This is like a hedonic price model — an implicit price model which assumes services are composed of a series of (perfectly divisible) attributes (e.g. quality differences) and enables isolation of values which contribute to observed price differences. Generally, frontier models have not fitted the data well but procedures such as robust estimation techniques can help in this regard (see for example Trewin et al 1995). In other cases data sets are more limited. Fortunately, the data that is available tends to come from the world's more liberal markets due to the competition policy regimes that affect service industries in these countries.

6. *Decomposing the wedge*

Even restricting the focus to price-impact or cost-price wedges, some fundamental issues remain such as whether these are best decomposed by 'building up' the impact of individual impediments or by 'breaking down' the wedge into components due to impediments and

those due to other factors. The preferred approach is to 'build up' the impact of individual impediments (see IC 1995). This approach provides conservative estimates by avoiding the unintentioned capture of other factors causing the price differences. It also builds on the earlier stage of listing an inventory of impediments. By enabling the explicit identification of impediments and their price impact, it minimises the danger that international price comparisons may not be between the same quality service or markets (in equilibrium). The cost function discussed in the previous part not only provides a basis for a measure of the extent of the wedge but it also provides the base for determining the extent of the costs of individual impediment components, for example by substituting factor costs that have been increased by certain impediments.

A survey of industry will be undertaken, designed to elucidate possible reasons for price differentials that are not policy induced, but instead reflect differences in the costs of inputs, the quality of outputs or business practices and other informal impediments. Benchmarking is as much a 'process' as a technique, establishing a framework in which bureaucracy and industry can communicate on the factors that cause differences between domestic and international prices. In an international study of this type, the 'black books' process developed by government and industry of one economy on the impediments they face in other economies could be used (see for example EC 1996, MITI 1996, USITC 1995, USTR 1995).

This industry input will then be objectively corroborated using some of the new approaches to valuation adopted in environmental economics. These new approaches include hedonic pricing methods where an estimate of an implicit price is obtained by reference to real markets where such features are traded. There can be problems with hedonic pricing such as with the specification of the function, multicollinearity and identification, with the function capturing the interaction of supply and demand factors. The hedonic approach is a little like that of statistical agencies in relation to adjusting price indices for quality changes (e.g. a constant utility index). Doing this for services is difficult but a watch on advertisements, etc and asking the service provider for detailed information often enables an assessment of changes. Contingent valuation may also be possible, where a direct attempt is made to elicit values via questionnaires (e.g. what would prices be on removal of a particular impediment). Essentially both these methods involve a separating out and valuing of costs that may cause price differentials. Other methods that may prove useful in determining whether the Law of One Price should hold in comparison of prices include those related to competitiveness and market power measures (e.g. Herfindal index).

7. Incorporation of the price-impact data into a General Equilibrium Model

Finally, in order that the impact on the wider economy (e.g. social welfare) of a particular set of impediments to trade in services can be measured, the relatively uninformative price-impact figures and other directly relevant information such as on quotas will be analysed in a modified GTAP model (Hertel 1997) capturing the structure of service industries. This will allow policy makers to quantify the costs of maintaining policies designed to exclude rival domestic and foreign firms from their service markets. Such an approach has been applied with frequency measures (see Brown et al 1995) and, although a useful first approximation, can be misleading and consequently distort policy advice.

Measuring the Impact of FDI Restrictions on Services Trade

FDI is the principal means used by foreign firms to establish a commercial presence. It is therefore impossible to talk about international trade in services without recognising the

crucial role of foreign direct investment (FDI). Even in today's world of rapidly improving transportation and communication technologies, commercial presence continues to expand as the dominant mode of delivering many services overseas. Cross-border trade for many services is either infeasible, since direct interaction is required between providers and consumers or, even where technically possible, is less preferred to commercial presence. Thus, for many services, effective trade liberalisation entails FDI liberalisation.

Any examination of impediments to international trade in services must therefore encompass FDI restrictions. Although often justified on other grounds, such restrictions can be the main impediment to trading many services internationally. Data on the relative importance of commercial presence as an international mode of delivering services is limited. However, US data on domestic sales of foreign affiliates suggest that it is the predominate mode — the value of services imported via FDI was around 30 per cent higher than the value of services imported cross-border in 1992 (USITC 1995). The share of total world FDI flows going to manufacturing has declined in recent years, while for services it has increased. Some one-half of the global FDI stock is now in services, and they represent some 60 per cent of annual world FDI flows (UNCTAD 1996).

GATS and FDI

The GATS explicitly covers commercial presence as one of the four modes of delivery.² It is the first multilateral agreement to recognise the central role of FDI in trading services. FDI restrictions in services (but not in other sectors) are now covered by a binding multilateral agreement, with countries making broad commitments to reduce these and other barriers to services trade. However, the GATS has had only a limited impact on liberalising services trade, including little relaxation of FDI controls.

Many countries, such as Australia, also listed blanket horizontal restrictions making all investment proposals subject to their foreign investment legislation. Moreover, horizontal restrictions on the temporary movement of people by most countries are also likely to affect the viability of establishing a foreign presence where experienced overseas personnel are needed.

The GATS schedules, as for other modes of supply, are a useful starting point to identify FDI restrictions across members. However, they provide a very incomplete picture of the extent and nature of such restrictions. Taken at face value, they suggest that less than one-quarter of all APEC service markets are open to commercial presence (PECC 1995). Moreover, this is likely to underestimate the restrictiveness of investment regimes. Many FDI barriers are simply not covered, nor identified.

A useful summary of the extent to which different types of barriers are used in APEC economies is provided in Figure 6 (PECC 1995). This was extended for foreign ownership limits by the Australian Industry Commission (IC 1996) and is captured in Figure 7. These figures highlight not only the diversity in measures across APEC, but also the degree to which some economies restrict FDI. As well as frequency measures of FDI barriers and sectors affected, investment coverage ratios help illustrate the wide occurrence of the restrictions. What emerges from the limited empirical work is that FDI barriers are widespread, take many diverse forms, and are likely to significantly affect services trade and economic efficiency of host countries.

² Commercial presence is covered by Article I in the GATS. Measures limiting the level of foreign ownership are expressly prohibited under market access commitments, unless specified in a country's schedule (Article XVI).

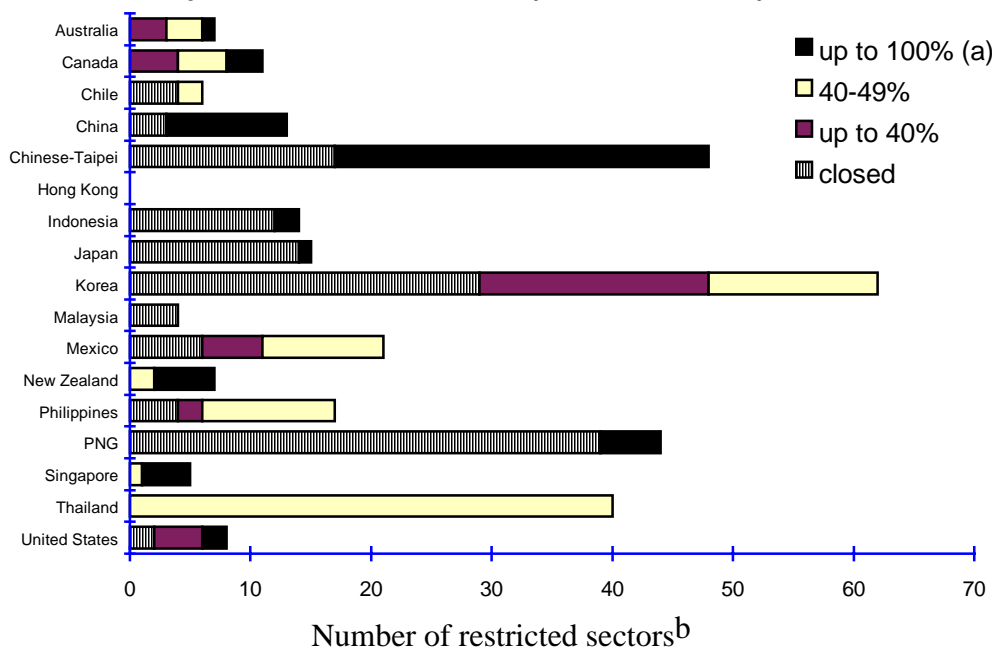
Figure 6: Schematic representation of major FDI impediments across APEC

	AU	BD	CD	CH	PR	HK	IN	JP	RO	M	ME	NZ	RP	PN	SI	CT	TH	US
	S	A	L	C	A	N	K	AS	X					G	N	A		
Screening/ notification	þ	þ	þ	þ	þ	□	þ	þ	þ	þ	þ	þ	þ	þ	□	þ	þ	□
Restricted/ closed sectors	þ	þ	þ	þ	þ	þ	þ	þ	þ	þ	þ	þ	þ	þ	þ	þ	þ	þ
Performance requirements	□	□	□	þ	þ	□	þ	□	þ	þ	□	□	þ	þ	□	þ	þ	□
Fiscal incentives	□	□	□	□	þ	□	þ	þ	þ	þ	þ	□	□	þ	þ	þ	þ	□
Taxation	□	□	□	þ	þ	□	þ	þ	þ	þ	□	□	þ	þ	þ	þ	þ	□
Priority sectors	þ	þ	□	□	þ	□	þ	□	□	þ	þ	□	þ	þ	□	þ	þ	□
Exchange controls	□	þ	□	□	þ	□	□	□	þ	□	□	□	□	þ	□	þ	□	□

Note: Areas with þ represent impediments to foreign direct investment. In order, the country abbreviations refer to Australia, Brunei, Canada, Chile, China, Hong Kong, Indonesia, Japan, Korea, Malaysia, Mexico, New Zealand, Philippines, Papua New Guinea, Singapore, Chinese Taipei, Thailand and the United States.

Source: PECC 1995.

Figure 7: Sectors subject to FDI restrictions, by APEC economy



a Foreign ownership levels vary in this category subject to the investment fulfilling certain operational requirements or conditions. These include: export requirements; local content provisions; geographical limitations; and conditions such as reciprocity.

b Sectors correspond to the 4-digit International Standard Industrial Classification.

Sources: IC (1996).

Such inventories of FDI restrictions, although useful, are generally inadequate, and are especially deficient in their analytical basis.³ This is not overly surprising given the diverse types of FDI restrictions that exist across countries. For example, over 57 varieties of FDI barriers have been identified (UNCTAD, 1996). Any useful classification will also need to be constructed with its intended purpose in mind. Ideally, an inventory of FDI restrictions should be comprehensive and be capable of classifying such measures according to their likely economic effects.

While such studies confirm that FDI restrictions mainly apply in services, they fail to provide a framework for measuring the impact of such restrictions on the efficient provision of services, and of their impact on the economy generally. To do so requires techniques aimed at measuring the degree of restrictiveness of such measures.

Establishing a framework for quantifying FDI restrictions

As useful and fundamental as these inventory studies are, they do not enable the effects of FDI restrictions on economic efficiency to be assessed. Access to such measures, even if applied in a limited partial framework, would provide important insights into the protective effects of FDI restrictions on services provision, and generate essential inputs into modelling the general equilibrium effects of FDI restrictions as trade barriers to services. However, such measures do not currently exist. Some important lessons can be drawn, however, from the

³ These inventories tend to rely heavily on self reporting by countries of their investment regimes. Consequently, much of the material available is 'patchy' across countries, and tends to focus more on the positive aspects of the regime, rather than the restrictive measures.

extensive work done on quantifying the domestic price and efficiency effects of tariffs and NTBs on trade in goods.

Although the difficulty of measuring the restrictiveness of FDI barriers is compounded by the vast array of impediments in existence, some measures, like for NTBs, may be more amenable to measurement and analysis than others. Indeed, as with trade barriers, first instincts would suggest that economic inefficiencies increase with less transparent measures. Strong economic arguments exist in favour of countries adopting more transparent measures to restrict FDI, such as clearly defined and administered limits on foreign ownership.⁴ Less transparent and indirect FDI barriers, such as screening requirements and operational restrictions, may well impose higher economic costs on host economies (and often foreign investors themselves) than more transparent measures, such as foreign ownership limits, provided such arrangements are administered openly and with a high degree of certainty. The difficulty is that governments, for various reasons, often prefer less transparent investment restrictions.

One way of measuring their impact would be to estimate price or rate of return impact of FDI barriers for services in the host country. As for trade barriers on goods, this could be a very useful way of comparing various FDI measures and modelling their impacts. However, such measures are likely to confront a range of conceptual and practical problems. Nevertheless, while measurement is difficult, the experience from measuring trade barriers for goods demonstrates that such estimates can be useful in analysing the economic costs of protecting services.

Conceptually, estimating the restrictiveness of the more transparent FDI measures could be done by identifying price or rate of return wedges. The relevant measures, or wedges, will however depend on the type of restrictions — for example, whether it is a direct limit on foreign ownership, or whether it involves some cost on the foreign investor. In some cases it will be appropriate to analyse the impact of the restriction in terms of its impact on asset prices or rates of return, while in others it would be best to identify impacts on the prices of the good or service that the foreign investor delivers. However, such measurements are fraught with difficulties, such as identifying the appropriate benchmark, especially the rate of return or asset prices that would apply without the FDI barrier. These conceptual and practical problems are compounded for less transparent FDI measures.

A major problem is that the direct link between the FDI restriction and its effects on prices will be unclear for many measures. Thus, even where a price/rate of return wedge is identified, it will be uncertain whether the gap incorporates the effects of the FDI restriction. Often, several FDI restrictions apply to a given sector and sometimes different foreign ownership limits apply to different firms in a sector, and to investment in new and existing firms. It is therefore difficult to identify which constraint is relevant and binding. Without some clear understanding as to how various FDI barriers impact on prices and rates of return, the extent to which the measure has been captured by the comparison will be unclear.

An alternate approach currently being applied at the Australian Industry Commission is to construct indices of the relative degree of FDI restriction for different sectors within countries, taking account of different types of restrictions and their likely economic significance. It may then be possible to arbitrarily translate these indices into tariff or tax equivalents. Although still only a proxy for measuring the restrictiveness of FDI impediments, the approach has the advantage of not considering all types of FDI impediments as being equally restrictive. A complete ban on foreign ownership would be

⁴ Such objective limits would also offer the advantage of being more amenable to reductions/removal within multilateral negotiations.

assigned a much higher weight (for example, one) than would notification requirements. Developing sensible indices of FDI restrictions would require decisions on:

- which impediments to include in the index;
- the weights to assign to each type of barrier; and
- the weights to use when aggregating across sectors.

Gaining general agreement on these fundamental questions will not be easy. However, as a general rule, the index would need to cover at least the major types of barriers; the weights across these would need to reflect the relative economic costs of different types of restrictions; and country indices of FDI openness would need to reflect the services share of domestic output.

The Industry Commission is currently investigating options for quantifying the degree of openness to FDI in APEC economies (including indices of openness), and alternatives for modelling the general equilibrium effects of restrictions on FDI in services across APEC economies. Results are expected to be available later in 1997.

Case Study - Measuring the Impact of Telecommunications Reform in Australia on International Calls

In this section, the seven steps in the approach to measuring the impediments to trade and investment in services just outlined will be applied in turn to the telecommunications sector, drawing on work by the Industry Commission (IC 1997).

1. Definition of service industries to be analysed

As can be seen from Table 1 there is a one-to-one concordance between telecommunications product and industry classifications at the broad 3 digit level. However, this level is too broad for meaningful price and costs comparisons, so the case study will concentrate on the main sub-sector that is of interest to APEC and was the focus of a recent Industry Commission paper, namely that of international calls. International telecommunication services are not distinguished in the ISIC classification and could be covered by a number of four or five digit level product classifications in the CPC (e.g. mobile telephone services, interconnection services). International calls are defined in the Industry Commission report as calls involving the international network in conjunction with local domestic networks; that is a system of country-to-country telecommunications links which are jointly operated by the international carriers of each country, and two domestic components connecting the call to an international gateway.

2. Identification of the specific impediments to trade and investment

Telecommunications was treated separately in the GATS with an Annex in the Final Act, but negotiations on basic telecommunications continued after the round with agreement being reached on 15 February 1997. Impediments that Australia would have listed in its GATS negotiations on telecommunications include in relation to national treatment and the commercial presence mode of supply, limits on foreign investment in the incumbent carriers. In relation to market access, the commercial presence mode of supply had limited ability for entrants to access international line links and domestic transmission capacity at the lowest price. In relation to the presence of natural persons mode of supply under both national treatment and market access there are some general impediments that apply across all sectors.

Since the GATS, Australia has introduced new telecommunications legislation effective from 1 July 1997 that is expected to have a marked impact on specific telecommunication impediments to the competitive provision of international calls. However, as the GATS listing is likely to be the basis of any international negotiations, this will be used as the list of impediments for the telecommunications case study illustrating the seven step approach.

The Industry Commission (IC 1997) identified as impediments to service providers supplying international calls prior to 1 July 1997 the following:

- Strategic Partnership Agreements that enabled Telstra to offer large volume business users discriminatory discounts that were not based on costs and locked out potential competitors;
- legislative limitations on access to, and hence the costs of, international half-links between Australia and foreign markets such as submarine cables and international satellites that are jointly owned, operated and maintained through consortia and cooperatives respectively;
- higher costs of national connections; and
- a lower quality in terms of the type of services offered as a result of national connections.

The limits on foreign investment in incumbent carriers mentioned above still applies after July 1 1997.

On top of these domestic impediments, there are some international impediments such as the international accounting rate system, that have contributed to high international call prices.

3. *Making explicit the theoretical link between the impediment and ‘prices’*

Under the terms of the *Telecommunications Act, 1991*, Australia opened up its telecommunications services market to competition from foreign service providers with one important caveat on market access. Until 1 July 1997, only Telstra and Optus were allowed to install and maintain telecommunications line links for the provision of public telecommunications services.⁵ The implications of this legislated duopoly on line links was that potential entrants were forced to purchase transmission capacity exclusively from one of the two carriers.

In the absence of essential facility legislation for potential entrants, both Telstra and Optus were able to sell access to transmission capacity — including international undersea cable and satellite capacity — at prices substantially above actual cost. This gave the carriers a significant cost advantage over service providers in each of the markets they compete; for example long-distance and international calls, internet access and data services. For consumers, this meant that prices were unable to fall to the same extent as possible if service providers had access to transmission capacity at competitive rates.

The other major impediment to services trade and investment in Australia is the limitations on foreign investment in the incumbent carriers. Under the 1991 arrangements, foreign investment in Optus was limited to 49 per cent. Changes announced in August 1997 removed these requirements allowing for full foreign ownership. All new carriers entering the Australian market now face no industry-specific foreign ownership controls. Importantly, however, the Telstra remains primarily in public hands. The legislation for the sale of one third of the dominant carrier limits foreign ownership to one third of that tranche, with individual foreign holdings also strictly curtailed.

⁵ Another company, Vodafone, was also allowed to build and maintain a third mobile telecommunications system.

As mentioned earlier, the implications for consumers of these foreign ownership limitations are less clear. However, foreign investment is thought to bring benefits in the form of new technologies and approaches that lead to lower cost and higher quality services. The detailed quantification of such benefits in the case of telecommunications is yet to be undertaken.

Under the international accounting rate system carriers charge each other for terminating international calls — services needed to complete an incoming call in the destination country. Settlement rates are paid to (received from) foreign carriers for terminating outgoing (incoming) services, and are negotiated bilaterally. High settlement rates are therefore both a cost (payment) and a benefit (receipt) to carriers, and the effect on individual carriers depends upon their balance of total outgoing and incoming calls. Reforming the international accounting rate system is a multilateral problem requiring a multilateral solution. Although such reform was not included in the recent WTO Agreement on Basic Telecommunications, despite Australia's attempts, the system's impact on prices would be expected to diminish as members increasingly open their telecommunications market to foreign competition, allowing foreign carriers the option of terminating their own calls.

Settlement rates, although declining in recent years, have not kept pace with rapidly falling costs. In 1995-6, Australian carriers' (tariff weighted) average settlement rate exceeded by sixfold the Industry Commission's estimated cost of terminating an international call. Whilst this system does contribute to higher outgoing call prices in Australia, the Industry Commission concluded that these prices are determined mainly by the competitiveness of the domestic segment of the international call market. A highly competitive Australian market would ensure receipts from termination services were used to reduce outgoing call prices.

4. *Determine the relevant price wedge*

In the previous subsections, three main impediments affecting Australian trade in international calls at the time of the GATS — a duopoly on link lines, FDI restrictions, settlement rates — were described along with their impact on prices and costs. In some cases, such as with FDI restrictions, the impact was not clear. Returning to Figure 5, more general restrictions such as on movement of natural persons ensure not all aspects of international calls are tradeable thus P_w is unlikely to be observed unless Australia is the world's best practice economy in this respect. The international settlement rate and impediments to FDI also ensure that P_w will not be observed. Finally, the duopoly on telecommunication line links meant the Australian market prior to the removal of these was either in a situation where P_m or P_r were relevant.

5. *Identify the appropriate benchmark market to measure the impact of the impediments*

There are a number of sources of international comparative data on telecommunications. For example, the ITU publishes on a country basis annual average prices per minute for various services plus annual average price for business and residential rentals. Although this data includes peak and off-peak prices, it does not include the many discounts known to exist in telecommunications. However, estimates of international revenue for 1994 and international minutes enables some average revenues per minute to be derived. The OECD provides estimates of revenue shares for each type of service but not minutes nor number of subscribers. Furthermore, the ITU provides total revenue figures for all countries for a

number of years and the OECD for selected carriers for a couple of years, and these figures could be divided by mainlines to give a per unit revenue figure which is comparable with cost figures. The comparative cost data is more limited than the price data just described. The OECD has published cost data taken from annual reports, broken down into depreciation, capital expenditure, R&D, personnel costs and other expenses (including marketing and billing) but not by service, for 58 large OECD carriers for 1995 and for a smaller subset in 1992. Some of this data has been put onto a spreadsheet and some preliminary analysis of it is presented later in this paper.

[See end of document for Figures 8 - 10]

Annual reports on other carriers in the APEC region are available but have not been entered into the data base.

As mentioned earlier, another option of using unimpeded domestic prices as a benchmark has a number of advantages and disadvantages. One advantage is that many differentials such as those related to quality are minimised as basically the same service is being compared. The main disadvantage is the lack of availability of unimpeded price information for all required services. For example, a number but not all unimpeded prices, will be available as a result of the 1 July 1997 reforms in Australian telecommunications that have been introduced.

In the perfectly competitive approach, world's best practice for each of the components in a telecommunications service are calculated and summed to create an adjusted cost figure to compare with prices. This was the approach undertaken in Industry Commission report (IC 1997). World's best practice cost figures are required for customer access network, local loop, long-distance, international gateway, international half-circuits, settlement rates, and marketing and billing costs. The necessary data is available for most of these components but not for a multiple of years. In terms of Figure 5, this research determined that Pm referred to a pre-1989 situation; Pr equalled \$1.11; Ph equalled \$0.47; Pi would be a post-1997 rate with world's best practices introduced; and Pw equalled \$0.22 without a settlement rate and with two-way bypass. It should be appreciated that these figures are not set in concrete. Competitive markets are dynamic, introducing new, lower cost services that soon make such figures dated.

6. *Decomposing the wedge*

Decomposing the wedge starts with a 'tops down' approach even though this is not the preferred approach. However, it is a useful initial approach, giving an upper bound on the extent of the wedge to be 'broken down' into components due to impediments and those due to other factors. It also provides information that can be used in the derivation of a world's best practice cost function, or a lower bound on the wedge, that then can become the basis for 'building up' the contributions of specific classes of impediments. The international comparative data mentioned in the last part can provide international revenue, cost or profit wedges that could then be adjusted for quality differences and regressed on standardised costs (including institutional costs) using a frontier function approach to determine world's best practice. These wedges are presented in Figure 8 for 1995 data ranked by company on the basis of revenue per mainline.

A perspective on how much cost and quality differences explain these wedges can be obtained from ranking the wedges on the basis of wages and salaries, and on the basis of mainlines and mobile subscribers respectively (see Figures 9 and 10). It is noticeable that

there are discernible trends in these Figures but also a number of outliers that may be explained by information on efficiency or better information on costs (e.g. institutional costs such as taxes) and quality (e.g. connection failures).

Quality differences need to be taken into account in any price comparisons. Hausman (1997) points out that the U.S. Bureau of Labour Statistics omits cellular telephones from its telephone services CPI. He estimates an augmented CPI that includes the decline in prices and the gain in consumer welfare from the introduction of these new services using yearly expenditure weights. These estimates show that such omissions bias the telecommunication services CPI, causing an estimated 8.5 per cent increase since 1988 to become a 20 per cent decrease.

As well as addressing these quality differences through hedonic price and other econometric models such as those discussed above, it is intended to try to elicit some information in the industry interview stage that will enable some contingent valuation of the price difference due to quality differences, impediments and so on.

Finally, valid international price comparisons will be dependent on the industries facing similar environments in terms of market structures, institutional arrangements and so on. These market pricing assumptions, often reflected in the Law of One Price, will also need to be tested. A flavour of the type of approaches that could be used in this area is given in the USITC publication on global competitiveness of cellular communications (USITC 1993) in which competitiveness measures such as market shares are regressed against various explanators such as the competitiveness of the home market, R&D, and so on.

7. Incorporation of the price-impact data into a General Equilibrium Model

As mentioned earlier, an important component of the overall approach is to convert the relatively uninformative price-impact measures and equivalent information such as on quotas into measures of impacts on the wider economy such changes in social welfare. The approach intended for doing this is to insert the price-impact and other measures into a modified CGE model, GTAP, that captures the structure of the service industries. As it is early days in the project, this stage has not progressed all that far although there are some other papers in this symposium that may cover this issue in more detail.

However, the approach has been applied to some degree previously. For example, Brown et al (1995) applied the approach using the earlier mentioned frequency measures augmented by judgmental estimates of sector tariff equivalents (set at 200 per cent for prohibited sectors and between 20 and 40 per cent for others), and at a very aggregative 5 service sector level. The tentative results of this analysis showed that service trade liberalisation appears to be as important as that for goods, endorsing the decision to include services in the Uruguay Round. It was noted the method could be improved by using the type of price comparisons discussed earlier.

Conclusion

In the paper is developed a seven step practical approach for measuring impediments to trade in services within the APEC region, building upon research undertaken in a 1995 PECC Survey of Impediments to Trade and Investment in the APEC region. The measurement was undertaken in seven steps, namely:

- (1) defining the service industry to be analysed;
- (2) identifying the specific impediments to trade;

- (3) making explicit the theoretical link between the impediment and 'prices';
- (4) determining the relevant price wedge;
- (5) identifying the appropriate benchmark market to measure the impact of the impediments;
- (6) decomposing the wedge; and
- (7) incorporating the price-impact data into a general equilibrium model.

Measuring the impact of FDI restrictions on services trade was dealt with separately because of the central role it plays in trading services, as recognised in the GATS. A case study based on the Australian telecommunications sector is used to illustrate the seven steps identified in measuring trade impediments to services. This case study shows that there are many difficulties in the approach, but that it leads to some progress in measuring trade impediments to services.

One issue that arises in the approach is that of aggregation. The approach being undertaken at the sub-sector level. This should not be so much of an analytical problem. However, it could be a negotiations problem, encouraging sector negotiations such as that on telecommunications, rather than a service wide negotiations, which are likely to offer larger gains, especially for a diverse collection of economies such as in APEC.

The difficulties in working through the seven steps highlighted a number of areas requiring future research. These included the need for better (e.g. more consistent) price and cost information; a better understanding of the impact of some policies (e.g. in respect of FDI) and other aspects on the market; the econometric estimation of world's best practice cost functions; and the incorporation of the various forms of information from the earlier steps into economy-wide models measuring the broader impact impediments to trade in services. An interesting thought on the value of trying to measure the impacts of impediments to trade in services is that if the impact cannot be measured then what are existing policies in this area to be based on, and how are proposed changes to be assessed?

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Figure 1: GDP by sector, APEC economies, 1994 (%)

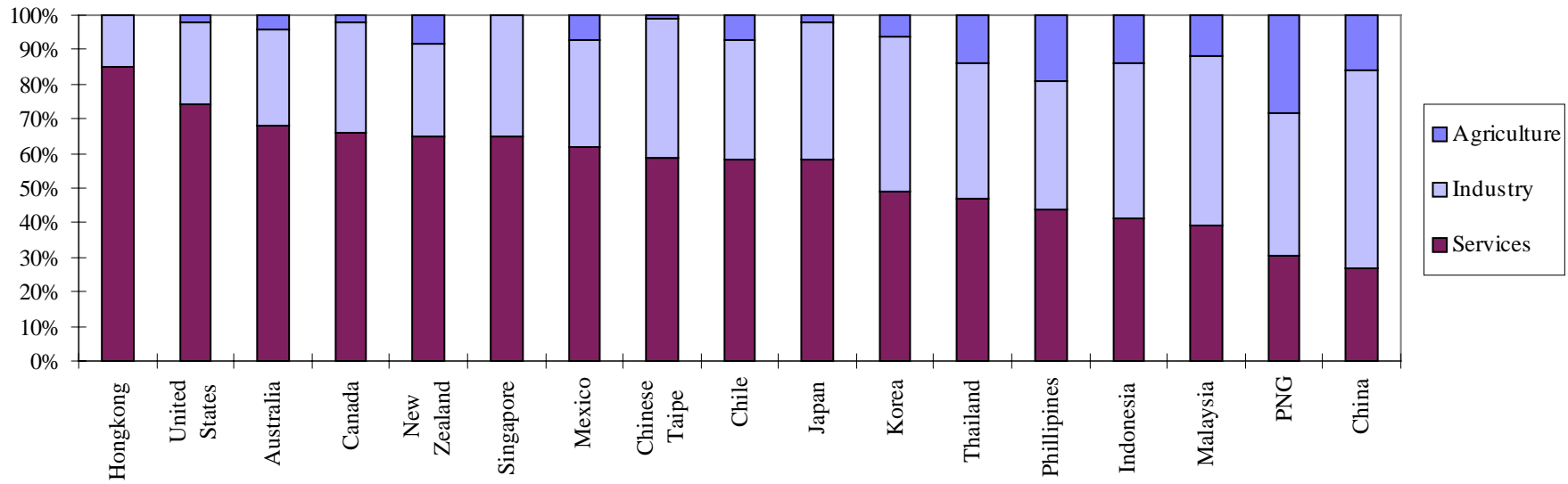


Figure 2: Services trade as a per cent of total trade, 1985 and 1993 (%)

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Figure 3: Services trade as a per cent of total inward stock of foreign direct investment, various years (%)

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Figure 4: Indicators of the absence of service sector commitments

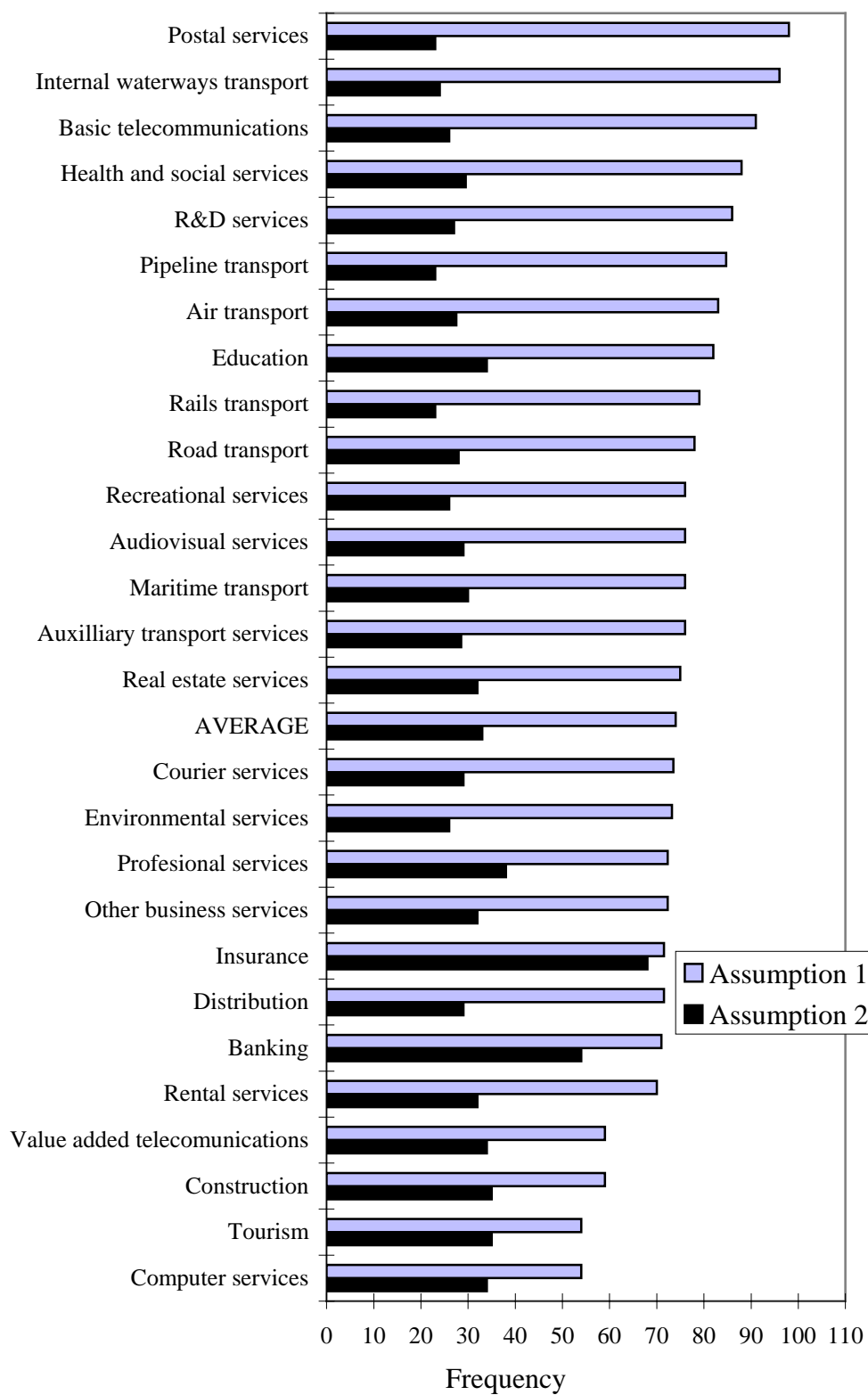
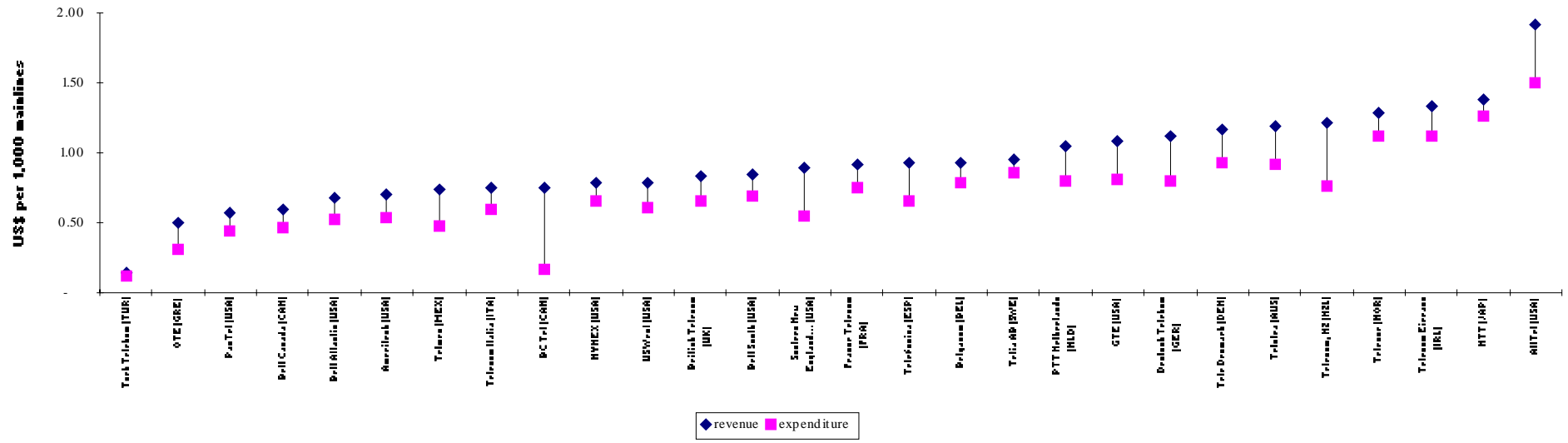


Fig. 8
1995, R & X per mainline



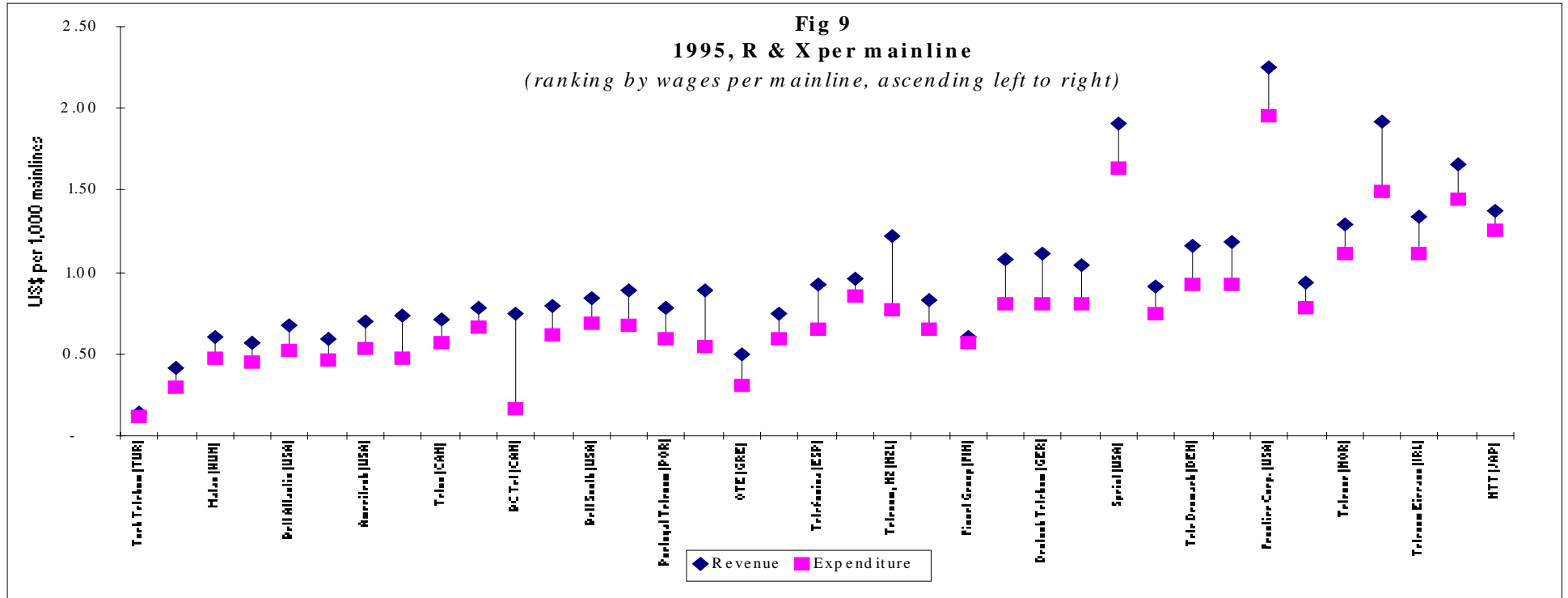


Fig 10
1995, R & X per mainlines
(ranking by mobiles plus mainlines per 100 inhabitants, increasing left to right)

